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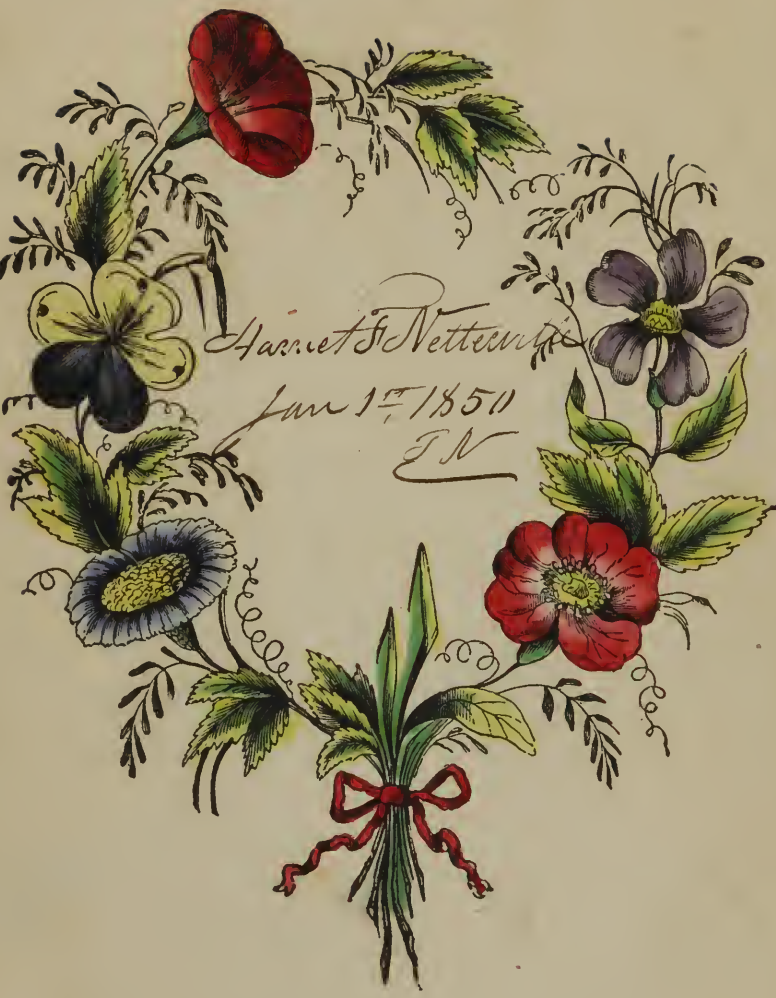

Harriet F. Nettleship
Jan 1st 1851
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GARLAND OF THE YEAR.

BEAUTIES OF FLORA,

AND

OUTLINES OF BOTANY,

WITH A

LANGUAGE OF FLOWERS.

A PERENNIAL OFFERING.

BY JOHN B. NEWMAN, M. D.

THE WHOLE ILLUSTRATED BY SPLENDIDLY COLORED ENGRAVINGS

BY LEWIS & BROWN.

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JOHN A. GRAY,

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PREFACE.

"HITHER, emerging from yon orient skies,
BOTANIC GODDESS! bend thy radiant eyes;
O'er each soft page assume thy gentle reign,
Pomona, Ceres, Flora in thy train.

"She comes, the Goddess! through the whispering air,
Bright as the morn, descends her blushing car,
Each circling wheel a wreath of flowers entwines,
And, gemmed with flowers, the silken harness shines:
The golden bits with flowery studs are deck'd,
And knots of flowers the crimson reins connect.
And now on earth the silver axle rings,
And the shell sinks upon its slender springs;
Light from her airy seat the goddess bounds,
And steps celestial press the pansied grounds."

DARWIN.

JOHN BARTRAM, a Quaker of Pennsylvania, who had, before the event we speak of, employed his time in agricultural pursuits, without a knowledge of Botany, happened, one day while in the fields, to gather a Violet and examine its formation. So prepossessed was he with the flower, that it occupied his thoughts by day and dreams by night. An irresistible, passionate desire to become acquainted with plants, was the result. He therefore studied as much Latin as was necessary to read works on the subject, such being then all written in that language, and soon became the most noted botanist of the New World.

There are as many Violets in our fields at present as when John Bartram made his examination; as curious in their formation, and as sure of producing the same effect on others as they did on him, could they but command observers. And not these flowers alone, for thousands more of every species surround us, quite as well deserving our attention, but sharing in the universal neglect. America, rich in all that constitutes wealth, lacks not the treasures of Flora; but, on account of want of knowledge, immense sums of money are annually sent out of the country to purchase medicines, which better information of our own resources would save; as we firmly believe that there are remedies enough in every country to cure its diseases.

The work is divided into four departments—Floral, Medical, Introductory, and Biographical. The first comprises the classification and description of each plant named; its history minute cultivation, and floral emblem, spiced with anecdote and original or selected poetry. The second enters fully into the medicinal properties of the plant, mode of preparing its extracts, doses, and sketches, in some cases, of diseases to which it is applicable; with a history of this branch of science, accounts of discoveries, and theory of the operation of medicines on the animal frame. The Introduction commences with the lowest tribes, and ascends upwards, teaching the different systems. The Biographical department will be found to contain interesting accounts of the lives and works of eminent living and deceased Botanists.

It concludes with a complete treatise in floral emblematical language, together with an ample dictionary of signatures.

The Fuchsia.

The Ladies' Ear-drop—Fuchsia Coccinea,—is an American plant, all the species being native in the Western continent, though most of them come from the Southern part of it, and a few from the West Indies. This beautiful plant was received with rapture in Europe, more especially in England; in speaking of it, Lindley remarks, that it is now one of the greatest of all the foreign ornaments with which their gardens are embellished in the summer and autumn. Every body, he continues, has Fuchsias: the poor weaver grows them in his window; many an industrious cottager shows them, as the pride of the little plot of ground before his door; and even the suburban inhabitants of London itself, speak of the beautiful Fuchsias they rear, with enthusiasm and delight. Mr. Lee of Hammersmith, was the first nurseryman who had the plant for sale, and the manner in which he obtained possession of it, is curious enough to induce us to inform our readers.

It is said that, about fifty years ago, he was one day showing his variegated treasures to a person, who suddenly turned and said: "Well, you have not in your whole collection so pretty a flower as one I saw to-day in a window at Wapping." "Indeed, and what was this Phœnix like?" "Why the plant was beautiful, and the flowers hung down like tassels from the drooping branches; their color was of the deepest crimson, and in the centre a fold of rich purple." Particular inquiries were made as to the exact whereabouts, and Mr. Lee posted off to the place, where he discovered the object of his pursuit, which he immediately pronounced to be a new plant. Full of admiration, he entered the dwelling of the owner, and calling for the mistress of the house, said, "My good woman, this is a nice plant of yours—I should like to buy it." "Ah, sir, I could'nt sell it for no money; it was brought to me from foreign parts by my husband, who has gone

away again, and I must keep it for his sake." "But I must have it." "No, sir, I cannot spare it." "Here," emptying his pockets, "is gold, silver and copper," his stock amounting to more than eight guineas. "Well-a-day, this is a power of money." "'Tis yours, and the plant is mine, my good woman. I'll give you one of the first young ones I rear, to keep for your husband's sake; I will, indeed." The bargain was struck, a coach called, in which old Mr. Lee and his apparently dearly purchased flower were deposited. *On returning home, his first work was to strip off and destroy every blossom and bud; the plant was divided into small cuttings, which were forced in bark-beds and hot-beds, and again subdivided.* Every effort was employed to multiply the plant. He soon became the delighted possessor of three hundred Fuchsias, all giving promise of fine blossoms. The two which first expanded were placed in his window. A lady came in. "Why, Mr. Lee, my dear Mr. Lee, where did you get this charming plant?" "'Tis a new thing, my lady—pretty, is it not?" "Pretty! 'tis lovely; its price?" "A guinea, your ladyship;" and one of the two plants, that evening, stood in beauty on her ladyship's table in the boudoir. "My dear Charlotte, where did you get that elegant flower?" "Oh, 'tis a new thing; I saw it at old Mr. Lee's; pretty, is it not?" "Really beautiful; what did it cost?" "Only a guinea, and there was another one left." The visitors' horses trotted off to the suburb, and a third beauteous plant graced the spot from whence the first had been taken. The second guinea was paid, and the Fuchsia adorned another drawing-room of fashion. These scenes were repeated, as new calls were made by those charmed with the attractions of the plant. Two plants, graceful and bursting into bloom, were constantly seen on the same spot. He gladdened the faithful sailor's wife with the promised flower, and before the season closed, nearly three hundred guineas jingled in his purse, the produce of the single shrub from the window of Wapping; a meet reward for his taste, skill, and decision. Soon after this, captain Firth presented one that he had brought from Chili, to the Royal Garden at Kew, from whence, we are told, it was soon afterwards distributed as a store plant. Mr.

Lee monopolized the trade, in a great measure, of this plant for some years, until its easy propagation becoming known, rendered its cultivation an object of little moment.

Until lately, the whole genus was confined to the greenhouse, but it was soon found to be sufficiently hardy to stand the open garden, if planted in warm situations, where it is sheltered from the North, and in a measure from the East winds, by a wall or buildings. Phillips remarks that, like the China Roses, which were for some years treated as tender plants, the Fuchsia is found to grow with greater luxuriance in the open air than when nursed as a house plant. Mrs. Loudon says, the greater number are now considered to be among the more ornamental of our hardy exotics. They grow freely in the open air, and enliven our flower gardens during the whole of the summer with their beautiful crimson flowers; and though they die down to the ground in winter, spring up from the root the following May, and, during summer, flower profusely.

This plant was named Fuchsia in honor of Leonard Fuch, a German botanist of the sixteenth century, famed for his skill in describing and drawing plants, for the latter of which he stood unrivalled; his drawings, in point of boldness and accuracy, comparing with any production of the present day. The specific name, Coccinea, means scarlet, evidently derived from its color. Besides its fanciful name, Ladies' Ear-drop, which we think well chosen, we have not been able to discover any other term for it in Europe, and its original South American appellation is unknown.

It belongs to the natural order Onagraceæ, or Evening Primrose tribe. It is in the class Octandria; order Monogynia. The generic characters are, calyx funnel-form, colored, superior, caducous. Petals four in the throat of calyx, alternating with its divisions. Stigmas four-sided, rather bulging. Berry long, four-celled, containing numerous seeds. Lindley observes that, in examining it, there is on the outside of all, a deep crimson covering, divided into four firm sharp-pointed leaves; this is the calyx. Rolled up within it, and closely embracing the stamens, are four little dark purple leaves, which are not half so long as the calyx; they are the petals. The eight stamens and four-sided stigmas will

be easily recognized. The fruit, like that of other plants belonging to its order, is not a dry hard case or capsule, bursting into four valves when ripe, but a berry, with a deep purple fleshy rind.

Phillips places the Fuchsia, in floral language, as the emblem of TASTE; for, with its richly-colored blossoms, there is a peculiar harmony and beauty in the unassuming appearance of the flowers, which hang with so much gracefulness from the elegantly shaped foliage of the plants. The length of the stamens adds greatly also to the beauty of these pendant blossoms, having the appearance of so many gems suspended from a small roll of the richest violet-colored ribbons, over which the beautiful carmine calyx hangs like a half-expanded parachute, allowing only a glimpse of the purple petals to be seen between the openings, the whole headed by an emerald-colored receptacle for the seed. The calyx buds, before expansion, have the appearance of ripe barberries, and the young branches and leaves have the veins tinged with the same fine crimson color, greatly contributing to the beauty of the plant.

Though any one of the species will strike freely from cuttings of the young wood, without bottom heat or bell glass, they will do much better with them. In this way they are easily increased, in the same way as myrtles, observing to give air so as to prevent damping off. The soil, at first, should be a little more sandy than that in which the mother plants were grown; plunged in a slight hot-bed and shaded, they will be fit to pot in about five weeks. Phillips directs that where a number of plants are required, it is more desirable to raise them from seed, which should be sown, according to him, in pots of rich earth placed in a hot-bed; others prefer to give them a rather sandy soil. So rapidly do these plants elaborate their juices, that if somewhat forced, or grown strongly, they will, unlike most perennial plants, flower the first year.

The GRACILIS, one of the best kinds for growing in the open air is naturally a handsome shrub, not exceeding four or five feet in height. Florists train it to a single stem, to form a tree, when it presents an enchanting appearance, the least breath of air setting all the pendant flowers in a graceful motion, an effect that cannot

be given to it when kept as a shrub, or trained to a wall. They first select a promising young plant with a strong leader, and removing it to a forcing-house, take off the side branches and leaves, above half its height. As fast as these shoot out again, they are cut off, and this process is continued for two or three years, during which time it is frequently shifted, according to its growth, into larger and larger pots. When ten feet high, it is placed in the green-house, where it will lose its leaves; for the great and uniform temperature of the hot-house, and constant supply of moisture will prevent this last, and keep it constantly growing in the hot-house. It is in the same manner, plants that with us annually part with their leaves, when taken to warmer countries become evergreen, and *vice versa*. In the warm countries of Europe, the Quince tree is an evergreen, but with us is yearly stripped. On the other hand, the currant when transferred to the island of St. Helena, was soon crowned with perennial leaves. The Fuchsia is allowed to rest in the green-house until the following spring, when as it begins to grow, the top is pinched off, and in the course of a few months it will produce a beautiful head, covered with flowers; and if planted so as to be surrounded by those of its own kind, a magnificent effect will be produced.

The Fulgens has tuberous roots, and herbaceous stems, as these last naturally decay when the seeds are produced, the roots should be taken up and kept dry till the following spring, and then brought forward in a hot-bed. The *Arborescens*, though a low tree in its native country, in colder climates requires the stove to succeed; considerable trouble is deservedly taken with it, which its display of fine foliage and terminal heads of lilac flowers, amply repays. From a cutting, it will attain the height of six feet in one year. The *Discolor* is a hardy species, brought from Port Famine, near the straits of Magellan, the dingy color of its flowers preventing much attention. The *Coccinea*, we are told, should always be kept in the green-house. Among the Fuchsias are some climbing species. They all hybridize freely with each other, and vary much from the seed, which ripens every year. And with the mention of the dark purple berry, a fruit, which

when ripe, is said to be well flavored and eatable, we will close our notice of the

" Graceful flower, on graceful stem,
Of Flora's gifts a favorite gem ;
From tropic fields it came to cheer
The natives of a climate drear,
And grateful for our fostering care,
Has learnt the wintry blast to bear."

Lessons from Flowers.

BY KEBLE.

Sweet nurslings of the vernal skies,
  Bathed in soft airs and fed with dew,
What more than magic in you lies,
  To fill the heart's fond view :
In childhood's sports, companions gay ;
In sorrow, on life's downward way ;
How soothing in our last decay,
  Memorials prompt and true.

Relics ye are of Eden's bowers,
  As pure, as fragrant, and as fair,
As when ye crowned the sunshine hours
  Of happy wanderers there.
Fallen all beside the world of life,
How is it stained with fear and strife,
In reason's world what storms are rife—
  What passions rage and glare.

But cheerful and unchanged the while,
  Your first and perfect form ye show,
The same that won Eve's matron smile
  In the world's opening glow ;
The stars of heaven a course are taught,
Too high above our human thought ;
Ye may be found if ye are sought,
  And as we gaze we know.

Ye dwell besides our paths and homes,
  Our paths of sin, our homes of sorrow,
And guilty man where'er he roams
  Your innocent mirth may borrow.

The birds of air before us fleet.
They cannot brook our shame to meet,
Bnt we may taste your solace sweet,
  And come again to-morrow.

Ye fearless in your nests abide,
  Nor may we scorn, too proudly wise,
Your silent lessons undescried,
  By all but lowly eyes,
For could ye draw the admiring gaze
Of Him who worlds and hearts survey.
Your order wild. your fragrant maze,
  He taught us how to prize

Ye felt your Maker's smile that hour
  As when he passed and owned you good;
His blessing on earth's primal bower,
  Ye felt it all renewed.
What care ye now if winters storm,
Sweep ruthless o'er each silken form;
His blessing at your heart is warm,
  Ye fear no vexing mood.

Alas, of thousand bosoms kind.
  That daily court you and caress,
How few the happy secret find,
  Of your calm loveliness.
" Live for to-day, to-morrow's light.
To-morrow's cares will bring to sight;
Go, sleep like closing flowers at night,
  And heaven thy morn will bless."

The Anemone.

The Greeks named this plant Anemone, from a word meaning the wind, because it flowers both in a windy season, and in exposed, tempestuous situations. By the ancients it was made the emblem of sickness. Pliny tells us that the magicians and wise men, in old times, attributed wonderful powers to this plant, and ordered that every person should gather the first Anemone he saw in the year, repeating at the same time, "I gather thee for a remedy against disease." It was then devoutly placed in scarlet cloth, and kept undisturbed, unless the gatherer became indis-

posed, when it was tied around the neck or arm of the patient. Some tell us that Anemone was a nymph, beloved by Zephyr. Flora being jealous, banished her from court, and changed her into a flower, which always opens at the return of Spring. Zephyr has abandoned this unfortunate beauty to the rude caresses of Boreas, who, unable to gain her love, agitates her until her blossoms are half open, and then causes her immediately to fade.

> The coy Anemone, that ne'er uncloses
> Her lips until they're blown on by the wind.—HOR. SMITH.

An Anemone with the motto,—*Brevis est usus*—admirably expresses the rapid decline of beauty. Others give a different origin to the flower, and agree with the ancients in making it the emblem of sickness, in allusion to the fate of Adonis, the favorite of Venus, who changed her loved one into this flower, after he had been killed by a boar, which was wounded by him in the chase.

> The flying savage wounded, turn'd again
> Wrench'd out the gory dart, and foam'd with pain;
> The trembling boy by flight his safety sought,
> And now recall'd the lore which Venus taught.
> But now too late to fly the boar he strove,
> Who in the groin his tusks impetuous drove;
> On the discolor'd grass Adonis lay,
> The monster trampling o'er his beauteous prey,
> Yet dares not Venus with a change surprise,
> And in a flower bid her fallen hero rise!
> Then on the blood sweet nectar she bestows,
> The scented blood in little bubbles rose,
> Little as rain-drops, which fluttering lie,
> Borne by the winds along a lowering sky.
> Short time ensued till where the blood was shed,
> A flower began to rear its purple head,
> Such as on Punic apples is reveal'd,
> Or in the filmy rind but half conceal'd.
> Still here the fate of lovely forms we see,
> So sudden fades the sweet Anemone;
> The feeble stems to stormy blasts a prey,
> Their sickly beauties droop and pine away.
> The winds forbid the flowers to flourish long,
> Which owe to winds their name in Grecian song.
> EUSDEN'S OVID.

Other mythologists relate, that Adonis was restored to life again by Proserpine, on condition that he should spend half the year with

her, and half with Venus. This is thought to imply the alternate return of winter and summer. The festivals of Adonis commenced with mournful lamentations, and finished with joy and gladness, which would seem to indicate a belief in his return to life. Phillips observes, that it was held in great estimation by the Romans, who formed it into wreaths for the head; and there is scarcely any flower better calculated to be artificially imitated for the purpose of ornamenting the temple of Venus; for, as its flowers are of such various colors, the Venuses of every tint, from the blackest child of Africa, to the fairest daughters of Britain or America, may suit their complexions by its wreaths.

Lindley remarks, that a charming little collection of pretty flowers is formed by the Anemonies, with their purple or white or scarlet petals, which modestly hang their heads, as if unwilling to expose their beauty to every curious eye. These have the calyx and corolla so mixed together, that one cannot be distinguished from the other; when the flowers are gone, they bear little tufts of feathery tails, or oval woolly heads, which are collections of the grains of the plant, and contain the seed; the tails themselves being nothing but the styles of the carpels grown large and hard and hairy; they are thought to be intended by nature as wings, upon which the grains may be carried by the winds from place to place. The leaves, stamens, young carpels and ripe seeds, are in every essential respect like the Crowfoot, which is the type of a natural order; and, as we shall soon come to it, will dispense with a notice here.

Phillips remarks, that the exotic family of Garden Anemonies has been imported into England from all parts of Europe, as well as from North America, to embellish and enliven the parterres at the earliest dawn of spring; and taking into account their infinity of varieties, and brilliancy of color, equally numerous, cannot refrain from expressing his regret that, at the present day, it should be so sparingly cultivated.

The Anemone is a genus of the class Polyandria, order, Polygynia, and natural order, Ranunculaceæ. Its generic characters are:—Petals five to fifteen. Seeds numerous, naked. There are a great many species, the majority remarkable for their delicacy

and early time of flowering; they may be found in the shade of the forest, in thickly scattered clusters and low stems. It was after seeing, very late in the season, a clump of these wild flowers in England, where some beautiful specimens are produced, the poet Campbell wrote:

> Ye field flowers! the gardens eclipse you, 'tis true,
> Yet wildlings of nature, I doat upon you,
> For ye waft me to summer of old:
> When the earth teem'd around me with fairy delight,
> And when daisies and buttercups gladdened my sight,
> Like treasures of silver and gold.
>
> I love you for lulling me back into dreams
> Of the blue highland mountains and echoing streams,
> And of brecken glades breathing their balm;
> While the deer was seen glancing in sunshine remote,
> And the deep mellow crush of the wood pigeon's note,
> Made music that sweetened the calm.
>
> Not a pastoral song has a pleasanter tune,
> Than ye speak to my heart, little wildlings of June,
> Of old ruinous castles ye tell,
> Where I thought it delightful your beauties to find,
> When the magic of Nature first breathed on my mind,
> And your blossoms were part of her spell.
>
> Even now what affections the anemone wakes!
> What loved little islands, twice seen in their lakes,
> Can the wild water lily restore;
> What landscapes I read in the primrose's looks,
> And what pictures of pebbles and minnowy brooks,
> In the vetches that tangled the shore.
>
> Earth's cultureless buds, to my heart ye were dear,
> Ere the fever of passion or ague of fear,
> Had scathed my existence's bloom;
> Once I welcome you more, in life's passionless stage,
> With the visions of youth to revisit my age,
> And I wish you to grow on my tomb.

The latest information informs us, that all the numerous and splendid varieties of these plants we meet with in the gardens spring originally from three species, the Coronaria, Stellata and Hortensis. The Coronaria has ternate leaves, with multified segments and long mucronate lobes. It has six sepals, oval-shaped and close, of a white color and rounded at the tip. It was originally

brought from the Levant, though little cared for, and its cultivation has always been carried on to a much greater extent in France and Holland than elsewhere. The Stellata has sepals of a simple purplish color throughout. The Hortensis, which is the one represented in our plate, expands its six petals in the form of a star, and was hence called the Star Anemone. It has been known to florists since 1596, and so improved that it may justly rank among the most elegant, as well as the most showy of the early flowers. Its colors run through all the shades of crimson, scarlet, purple, blue and yellow, down to pure white, with all the delicate intermediate tints of peach blossoms, violet, pink and primrose; and frequently the petals are beautifully striped, or exquisitely shaded, from the fullest of each color, to the softest stain of each dye. These flowers are equally admired in the single state, semi-double, or when all the filaments are converted into petals. It grows naturally in the southern part of Europe. Phillips tells us that the Turks distinguish those with double flowers, by the name of *Guil*, and *Gulcatamer* and the variety with cut or parsley-leaved foliage, *La lé benzede Galipoli la lé*, whilst those with single, are named *Binizate*, and *Binizade*.

When these plants are required to flower in perfection, the highest authorities direct a mixture of loam and rotted produce of the cow-yard, which should be prepared a year before using, and frequently turned over in that time. Where the Anemonies are to be planted, let holes be dug of the size the clumps are to be formed, of about eighteen inches deep, and filled to the height of six inches with well-rotted cow-yard produce. Fill the remaining space with the prepared compost, and wait a few days to allow the whole to settle, before planting the roots. Observe to place that side of the roots next to the earth, in which the decayed rudiments of thready fibres are seen, then cover them about two inches deep with the prepared soil; if their fibres are rubbed off, it will require some care to discover the side that contains the bud, which of course should always be uppermost. All the pieces accidentally broken off should be preserved, as they will grow and form fresh tubers. The distance between them should be about four inches.

A celebrated florist recommends a planting in the middle of September, a second in October, and a third in November, by which means the clumps will flower in succession during the spring; and also some roots reserved for the spring planting, which will flower during the summer, and those planted as late as August, in the autumn. Anemone roots resemble bunches of small black potatoes; in choosing them, those of a moderate size, fresh and plump, should be selected; for large roots that are hollow in the centre never blow strong. They may be divided to increase the best varieties, but it is probable the new plants will be too weak to flower the first year. Early in May, the Anemonies come into bud, and it is useful at times to erect an awning over them, but one that can be easily removed when necessary, as the tubers are very liable to be injured, and even to become mouldy by damp. While growing they should often be watered, to prevent the fibrous roots withering from drought. After flowering, an awning should be spread over the plants, and they kept quite dry till the leaves decay; the moment the last appearance is observed, take them out of the ground, as allowing them to remain in it, will cause in many cases shooting afresh, thereby weakening them very much, without any gain, and after carefully washing on a mat in a dry shady place, where there is a good current of air, put them in bags, and keep them suspended from the ceiling of a dry room. Another method of raising garden Anemonies, is to make a bed ef the size wanted, eighteen inches deep, covering it six inches from the bottom with a layer of stones and brickbats, six inches deep, to serve as a sure drainage. The bed is then filled with fresh loam, drills made, and the tubers planted in them, a little sand being previously strewed along the hills; over the whole is placed a layer of cow-yard produce, three or four inches thick. If these beds are planted in autumn, they are not watered till the leaves appear, but if in early spring, every day till they flower. Mrs. Loudon says, that the watering carries the manure in small quantities into the ground, and that the young plants thus treated will grow grow and flower with extraordinary vigor. She says there must be, at least, two inches of loamy soil between the cow-yard produce and the tubers, for, if not, these last will be rotted.

We are told that the stem of an Anemone, from which seed is calculated to be taken, should be strong, elastic and erect, and not less than nine inches high. The corolla should be at least two inches and a half in diameter, consisting of an exterior row of large, substantial, well-rounded petals, or what is termed guard leaves, at first horizontally extended, and then turning a little upwards, so as to form a broad shallow cap, the interior of which should contain a great number of long small petals, imbricating each other, and rather everting from the centre of the blossom. The color should be clear and distinct when diversified in the same flower, or brilliant and striking, if it be but simple, as blue, crimson or scarlet, in which case the bottom of the broad exterior petals, is generally white; but the beauty and contrast is considerably increased, when both the exterior and interior petals are regularly marked, with alternate blue and white, or purple and white stripes, which in the broad petals should not extend quite to the margin. The seed being very light and downy, must be gathered from time to time as it opens, for it will otherwise be blown away by the first breeze of wind. In August, a good bed of mould should be prepared, and the seeds being mixed with sand, so as to prevent their falling in lumps, must be strewn as regularly as possible, and then some earth should be lightly sifted over the bed, about a quarter of an inch thick. If the season should prove dry, the bed must be watered in the most gentle manner, so as not to wash the seeds out of the ground. For this purpose, a watering-pot should be used, with a nose perforated by very small holes, that will only discharge fine streams of water. It is also advisable to cover the beds with a mat, during the great heat of the day, but always attending to the removing of the mat at sunset, so that the bed may have the advantage of the moist dews and gentle showers. The young plants appear in about ten weeks after they are sown, and will require considerable care in their protection from severe frosts. In the following autumn, the beds should be carefully weeded, and additional mould, about a quarter of an inch, placed over them. The plants generally flower the second year, after which the roots may be taken up as before directed.

We will close with an anecdote relating to a Parisian florist, named Bachelier, who, having procured some beautiful specimens of these plants from the East, kept them to himself in the most miserly manner for ten years, during which time neither love nor money could obtain the least root of one of these rare plants from the selfish florist. A witty member of the French Parliament, vexed to see one man hoard up for himself what ought to be distributed to beautify gardens in general, paid him a visit at his country house, where, in walking around the garden, and observing the Anemonies were in seed, let his robe fall upon them as if by accident; by this device, he swept off a considerable number of the little feathery seeds, which stuck fast to it. His servant, whom he had purposely instructed, wrapped them up in a moment, without exciting suspicion or attention. The innocent theft was made known to the friends of the member, who enjoyed the joke against the niggardly florist, and they, by this project, soon spread the young plants over the Parisian gardens.

Tea.

A Chinese historian, giving an account of the origin of Tea, tells us that Darmal, son of an Indian king, landed in the Celestial Empire, in the early part of the sixth century. He took the utmost pains to spread through the country, a knowledge of God and true religion, devoting his whole time to the business; and to stimulate others by what he thought a good example, imposed on himself privations of every kind, spending the greater part of his time in the open air; he was almost constantly praying, and often fasted for a considerable length of time. On one occasion, being worn out with fatigue, he fell asleep, against his will, having vowed to keep awake; rousing himself with a desperate effort, and determining to atone for the oath he had unconsciously violated, he cut off what he judged the offending members—the eye-lids—and threw them on the ground. Passing the same place the next day, he found them changed into a shrub which

the earth had never before produced. Having eaten some of its leaves, he felt his spirits exhilarated, his strength restored, and though exceedingly drowsy, a complete and instant restoration to wakefulness. He, of course, recommended the plant to his disciples and followers, by whose means its reputation increased, and since whose time it has been generally used.

As might be presumed from the foregoing narrative, the Tea plant is a native of China and Japan, extensively cultivated in both countries, but most abundantly in the former, which place it has been used among the natives from time immemorial, and from the age of Confucius, has been the constant theme of praise among the poets. We are told that it is only in a particular tract of the Chinese empire that the plant is cultivated; and this tract, distinguished by the natives as the Tea country, is between the thirtieth and thirty-third degree of north latitude, situated on the eastern side. It will grow in almost any part, from Pekin in the northern division, to Canton in the southern, yet attains greater perfection in the intermediate country, where it is neither too hot nor too cold. There have been for a long period a few plantations near Canton, which have deceived some writers into the supposition that it grew there as well as any other part of the country.

The Tea plant belongs to the natural order Ternstromiacea, from which order it has been many times removed by botanists, but finally restored. Lindley remarks, that although many of the plants which are known in this order, come chiefly from China and our own country, they after all form but a very inconsiderable part of the whole number belonging to it. China contains some seven or eight, and North America four or five, while sixty or seventy are beautiful trees and shrubs, natives of the woods of South America; about twenty are known in the East Indies, and one comes from Africa. The Tea which is so extensively consumed, is produced by the THEA CHINENSIS, often flavored by different species of Camellia. It is an evergreen shrub, in the class Monadelphia, order Polyandria, but from ignorance of the union of the filaments at their base, placed by Linneus in the class Polyandria, order Polygynia. The generic characters are: calyx

five or six-leaved, coral six or nine petals, with a three-seeded capsule. Linneus has given two species of the plant, the Bohea and Viridis, which merely differ in the number of petals, the worst possible kind of distinction, as nothing can be more uncertain than number in botany; the petals, in the generality of cases, even varying in the same plants. Hayne divides the genus into three species, Stricta, Bohea and Viridis, distinguished by the shape of the fruit and leaves, and direction of the footstalk. This was much better, and had his information been as accurate as he could have desired, would have answered; but botanists almost universally agree with DeCandolle, who admits but one species, with two varieties, the *Viridis* or green Tea, with flat lanceolate leaves, three times as long as they are broad, and the *Bohea,* with elliptical, oblong wrinkled leaves, twice as long as broad. The cultivated variety resembles a myrtle considerably in appearance, and is from four to six or seven feet; capable, it is said, in favorable situations, of attaining a height of twenty or thirty feet. The branches are very numerous, rising alternately, and furnished with long spear-shaped leaves, which are minutely cut with saw teeth, except at the base, smooth on both sides, of a shining green color, the central rib and veins distinctly marked, and supported on short footstalks. The leaves vary from one and a half to three inches in length, and from one half an inch to an inch in breadth. The flowers are sometimes solitary, and sometimes supported two and three together at the angles formed by the leaves and stem. They are quite large, set in a short green calyx of five, six or more divisions, having the corolla with large unequal petals, varying from four to nine, with us of a snow-white color, though Mrs. Ellis speaks of seeing them in their native state yellow; numerous stamens, with yellow anthers of a bright color, beautifully contrasting with the white of the petals, and connected at the base, come next, and innermost of all, the stigma with a three-parted style. The fruit is a three-celled and three-seeded capsule. Mrs. Loudon describes the Teas as half hardy shrubs, evergreen, and nearly allied to the Camellia, from which indeed they differ only slightly in the capsule. They are half hardy in British gardens. The Bohea requires protection every winter, but the Viridis will live in the open

air with slight protection, such as laying straw over the roots in severe frosts. The flowers of both varieties resemble those of small single white Camellias, (a much better description is that comparing them to the wild rose of the hedges); these flowers are succeeded by soft green berries or pods, each containing from one to three seeds. We cultivate them principally in green-houses, but they are by no means of rapid growth, and are retained more from the curiosity which most persons feel to see the plants producing tea, than from any real beauty they possess. There is but little reason to wish it was better adapted to our climate, for the amount of labor required for its culture, and for the preparation of the leaves, would, at the lowest rate paid here, raise the produce to a price out of all proportion greater than we now pay for the tea of China, burthened as it is with the expenses of a long voyage and government duties. Attempts have been made in Brazil, and various other places, where no obstacle is offered by climate, to cultivate the plant; but the comparative dearness of labor in all quarters, offers a serious barrier against the successful prosecution of such schemes.

This plant is called by the Chinese, *Tcha* or *Tha.* It is propagated from seeds, which are deposited in holes drilled in the ground, at equal distances, the rows being regular, and four or five feet asunder; but so uncertain is the vegetation, even in their native climate, that it is found necessary to sow as many as seven or eight seeds in every hole, not above a fifth part, in the most favorable circumstances, being expected to grow. Before coming to maturity, they are carefully watered; and though when once sprouted, they would continue to vegetate without further care, still great pains are generally taken to manure the ground, and root up the weeds that would consume the nourishment required to perfect the precious vegetable; and the plants are not allowed to attain a higher growth than admits of the leaves being conveniently gathered. The first crop of leaves is not gathered until the third year after sowing, at which period they are in their prime, and by far the most plentiful. At seven years old, in a few cases not until ten, the leaves will have grown coarse, and thinly scattered; the plant is then cut down to the stem, to allow for the

shooting forth of an exuberant crop of fresh shoots and leaves. The process of gathering it is one of great nicety and importance. We are told, from undoubted authority, that each leaf is plucked separately from the stalk, the hands being kept carefully clean, and in most cases the breath not being permitted to touch them. The emperor has a special place for the growth of his Tea, at Udis, in the island of Japan, its climate being supposed peculiarly congenial to the growth of the plant. No one, except the appointed officers, are allowed to come near it, and the shrubs are tended with much more care than human beings, for they are carefully cleansed from dust, and protected from any inclemency of the weather. The laborers are obliged for some weeks previous to collecting the leaves, to abstain from all gross food, wear fine gloves while at work, and bathe two or three times a day. As might easily be supposed, the office of servant in this place is much coveted by the lower orders of Chinese, as the periods spent there, are the only times of enjoyment in their whole lives. Laborers collect in the common pickings, from four to fifteen pounds a day. The leaves are gathered according to the age of the tree, from one to four times a year; most commonly, however, three times. The first picking commences about the middle of April, the second at Midsummer, and the last during August and September. The Tea diminishes in price and quality, in proportion to the lateness of time in which it is gathered. From the first, consisting of the young and tender leaves, only the most valuable Teas are manufactured, viz: the green, called *Gunpowder*, and the black, called *Pekoe;* these are of the most delicate color and aromatic flavor, with the least portion of either fibre or bitterness. The name Pekoe is a corruption of the Canton term PAKKO, *white down*, from the early leaf buds of which it is made, being covered with a fine silky down. As the removal of these buds must injure the shrub, and deteriorate its future produce, it is consequently very dear, and small in quantity. It is more damp and liable to injury than the other species, as its delicate aroma forbids the application of much heat. A green tea species of this is made, which it is said has never been brought to this country The Mandarins send it in very small canisters to each other

under the name of *Loong-tsing*. A few days longer growth, allowing the buds to expand, produces the *black-leaved Pekoe*.—The more fleshy and matured leaves constitute *Souchong*, the finest of the stronger black teas; they begin at this time to be entire and curled, and among the finer kinds, for the purpose of scent, are mixed flowers of the Chloranthus and Gardenia.—Souchong is from *Seaou-choong*, small or scarce. Still larger and coarser, the leaves form *Congou*, so called from a corruption of *Koong-foo*, labor or assiduity; this was formerly the great staple tea of Europe and America. The latest picking is *Bohea*, so called from the name of the district in which it is prepared and cultivated. It is larger and coarser, containing more woody fibre than any of the others, makes a darker colored infusion, and will keep better, from bearing more heat to drive off its moisture when prepared. Two kinds of it come to us, the proper Bohea, and Canton Bohea, the last being the poorest and coarsest of the whole, and still selling well from its strength, a quality more prized than flavor among the generality of people.

The green teas are generally divided into five kinds. *Twankay*, which forms the bulk of the imported sorts, has the oldest leaf and is the best twisted, standing in the same relation to the Green that Bohea does to the Black teas. *Hyson Skin*, a refuse of Hyson, *Hyson* meaning flourishing spring, from being gathered in the early part of the season; each separate leaf is rolled and twisted by the hand, and it is on account of the extreme care and labor required in its preparation, that it is so expensive and difficult to procure. *Gunpowder*, a carefully packed article of this last kind, has been mentioned; it is called by the Chinese, *Ohoo-cha*, pearl tea. *Young Hyson* is the last and finest: a writer in speaking of it, remarks that it was spoiled by the demand of the Americans. Formerly it was a genuine, delicate young leaf, called in the original *Ya-ts-ien*, before the rains, because gathered in very early spring. As it could not fairly be produced in any large quantities, the call on the part of the Americans was answered, by cutting up and sifting their green tea through sieves of a certain size; and still worse, the coarsest black tea leaves were cut

up and colored with a preparation resembling the hue of the green teas. The writer forgot, if he knew it, to add, that the fraud was detected, and the false teas bought at a mere nominal rate, though sold both here and in England at high prices.

Owing to the minute division of land in China, there can be but few large tea growers; each family does its own work, and immediately after picking, carries and sells the produce to a class of persons, whose business it is to collect and dry the leaves for the Canton merchants. Some kinds are dried merely by the heat of the sun; others in heated pans; the black principally in the last. It is a vulgar error, that green tea owes its color to being dried on copper pans. After drying, the tea is put in baskets, and subsequently packed in chests and canisters. The black teas, we are told, are trodden down with the feet to make them pack close, a process that would crush the green, which is accordingly only shaken in the chests.

The first European writer who mentions tea, was Botero in 1590, an Italian, who tells us the Chinese have an herb, out of which they press a delicate juice serving them for drink instead of wine; preserving the health, and freeing them from those evils which the immoderate use of wine produces on its abusers. Too many have written since then about it, to mention even their names. The Chinese, as we have mentioned in the medical department, do not use their tea until it is about a year old, on account of its active narcotic properties when new. We have it direct from them, but the English still later, as in addition to the length of time occupied in its collection and transport to England, the East India Company are obliged by their charter, to have always a supply sufficient for one year's consumption in their London warehouse; this regulation, which enhances the price to the consumer, is said to have been made by way of guarding, in some measure, against the inconveniences that will attend any interruption to a trade, entirely dependent upon the caprice of an arbitrary government. Three times at least in the day, every Chinese drinks tea, and if his means are ample, has recourse to the refreshing beverage more frequently; it is the constant offering to a guest, and forms

a portion of the sacrifices to idols. They prepare it in the same manner as ourselves, but use neither milk nor sugar. The working classes are obliged to content themselves with a very weak infusion. Mr. Anderson, in his narrative of lord Macartney's embassy, relates that the natives in attendance never failed to beg the tea leaves remaining after the Europeans had breakfasted, and with these, after submitting them again to boiling water, made a beverage which they acknowledged was better than that which they could ordinarily obtain. A writer remarks, that the history of commerce does not present a parallel to the circumstances which have attended its introduction into Great Britain. The leaf was first imported into Europe by the Dutch East India Company, in the early part of the seventeenth century; but it was not until the year 1666, that a small quantity was taken into England by two noble lords; yet from a period earlier than any to which the memories of any of the existing generation, or their predecessors can or could reach, tea has been one of the principal necessaries of life among all classes of the community. In 1664, two pounds two ounces was considered a present not unworthy king Charles the second, to receive from the East India company, which company, for the first time, gave an order three years afterwards to their agents, to send them one hundred pounds of the best tea that could be got. When brought from Holland, it was worth at that time upwards of twenty dollars per pound. It did not make much progress during the early part of the eighteenth century, being still a scarce luxury, confined to the wealthy, made in small pots of the most costly China, holding not more than half a pint, and drank out of cups of the proportionate capacity of a table spoon. To this period, may be referred the well known anecdote of the country lady, who receiving as a present a small quantity of tea, looked upon it, totally ignorant of its real use, as some outlandish vegetable, boiled it until she thought it was tender, and then throwing away the water, served the leaves in butter to her company.

While the Chinese devote themselves to the cultivation of this plant as an article of commerce, the Japanese use it for a secondary

purpose, making hedgerows with it around their rice and corn fields. Various foolish stories are told about it, of which we shall merely mention one, that deserves, from the general belief with which it has been received, to be placed with the poisonous dying copper pans of the green tea. It is said, that the finest specimens grow on the precipitous declivities of rocky mountains, where it is too difficult or dangerous for human beings to gather them; and that the Chinese, to secure the possession of the apparently inaccessible treasure, pelt a race of monkeys which inhabit these recesses with stones, provoking them to return the compliment with a shower of tea branches. We find this story gravely refuted, and the fact stated, that the tea plant whose leaves are worth gathering for home use and commerce, is a cultivated and not a wild plant, and where man could not approach to gather, he certainly could neither sow nor water. The greater probability is, however, that the monkeys have discovered the delicious properties of the tea, and make their own infusion, and as stones are generally plenty in the places it is said to grow, return, when attacked, instead of tea branches, their opponent's salute in the same coin.

Gassicourt found green tea to contain gallic acid, tannin and bitter extractive. Distilled with water, Frank discovered traces of a volatile oil. Black tea has the same general constituents, but contains less volatile oil than the green. Ondry made from tea, a crystallizable principle, which he called *Thein*; it is colorless, soluble in water and alcohol, and fusible.

We will conclude our description of tea, in which we think every thing relating to it is combined, by making it the emblem of RESOLUTION, from its agency in the celebrated Boston Tea Party of ushering in the struggle for Liberty.

The Chestnut Tree.

The Chestnut Tree—Castanea Vesca, is in the class Monœcia, order Polyandria, and natural order Cupuliferæ. Its generic characters are: Staminate flowers—Ament naked, long and somewhat cylindric. Calyx one-leaved, six cleft. Stamens ten or twelve. Pistillate flowers—grow by threes. Calyx six leaved, armed with sharp prickles. Germs three. Stigma pencil form. Nuts one-seeded and invested with prickles. A beautiful provision of nature can be noticed here by the most casual observer, that of the female flowers only having prickles, which serve as a protection to the fruit, whereas in the male which is destitute of that armor, it would be useless. Specific characters; leaves oblong, lanceolate, acuminate, mucronate serrate, glabrous on both sides. This natural order of trees can be known from among its brethren, by the amentaceous flowers and peculiarly veined leaves. Lindley remarks that from all other plants, they are distinguished by a superior apetalous rudimentary calyx, the fruit enclosed in a peculiar husk or cap, and containing but one cell and one or two seeds, in consequence of the abortion of the remainder. They are inhabitants of the forests of all the temperate parts of the continent, both of the Old and New Worlds, extremely common in Europe, Asia and North America, rare in South America and Africa. The species which abound between the tropics of either hemispheres, are chiefly oaks and chestnuts, which are found on the high lands, but unknown in the valleys of equatorial regions.

The Chestnut tree, we are told, is a native of Asia, in many parts of which it is found in situations where it is not very likely to have been planted. Tradition says it was brought from Asia Minor, and that it soon spread over all the warmer parts of Europe. In growth it is not unlike the oak, except that its branches are more straggling. Though it is capable of covering a considerable space of ground with its branches where it has room, yet planted closely, it will grow to a considerable height.

It is the tree with which the celebrated painter Salvator Rosa delighted to adorn his bold and rugged landscapes. Most likely he was led to select it particularly from its flourishing in the mountains of Calabria, the scene of many of that great artist's pictures.

The generic term is derived from a city in Thessaly of the same name, famous for the trade it formerly carried on in this article. We find it named in the old books, Jupiter's acorn, and Sardinian acorn. With us, the chestnut is a fine and serviceable timber, as well as fruit tree. Formerly its wood was in much request, on account of its strength and durability for the most costly and substantial buildings, being said to bear the changes from wet to dry better even than oak, and to have shown no symptoms of decay in buildings that have been erected many centuries. In the transactions of a Society, of Arts in England as far back as 1789, is an account of the comparative durability of oak and chestnut when used for posts. Posts of oak, and others of chestnut, had been put down at Wellington, in Somersetshire, previous to 1745. About 1763, when they had to undergo repairs, the oak posts were found to be unserviceable, but those of chestnut very little worn. Accordingly the oak ones were replaced by new, and the chestnut allowed to remain. In twenty-five years, the chestnut posts that had stood twice as long as the oak, were found in much better condition than those. In 1772, a fence was made partly of oak posts and rails, and partly of chestnut. The trees made use of were the same age, and both young. In nineteen years the oak posts had so decayed at the surface as to need support, while the chestnut continued unimpaired. A gate post of chestnut, on which the gate had swung fifty-two years, was found quite sound when taken up, and a barn constructed of chestnut in 1743, was found sound in every part in 1792. It would seem, therefore, that young chestnut is superior to young oak for all manner of wood work that has to be partly in the ground. It should be remembered that in extreme age, its timber is not so valuable as when of a moderate size. One advantage of the chestnut is, that there is very little sapwood; and thus in

the growing state it contains more timber of a durable quality than an oak of the same dimensions.

When growing, it presents a handsome and majestic appearance, and there are very ornamental varieties; one, in particular, having curiously striped leaves. The flowers, which are of a lightish green, come out in their peculiar clusters in June.

The CASTANEA PUMILA—CHINQUAPIN of the Southern states, is distinguished specifically by its oblong leaves, which are sharp, with a rounded end, tipped with a prickle, serrate or sawed into fine teeth on their margin, and distinguished from those of the chestnut by their whitish and downy under surface. The flowers are nearly the same color, and come out about the same time. With us, in the Middle States, it is a shrub of some six or eight feet in height, but in a more southern and warmer section of the Union, it rises to a height of thirty-five or forty feet.

The chestnut has a prickly covering, as we remarked before, and the nuts grow in a lengthened cluster, upon twigs. The kernel is large, and enveloped in a tough coat, of a tint so peculiar as to give name to a particular kind of color. When raw, it has a slight taste of the walnut, but much inferior to that noble fruit. Roasted, it becomes farinaceous, and resembles a mealy potatoe. It contains the most meal, and least oil of any of the nuts, and therefore, though it may not be so nutritious, is more easy of digestion. Chestnuts, to bear the best kind of fruit, must be grafted.

In the southern part of the continent of Europe, where chestnuts grow abundantly, they form a large portion of the food of the poorer classes, who, besides eating them raw and roasted, as we do in the United States, form them into puddings, cakes, and even bread. This applies more particularly to Spain and Italy, where the choice with the consumers is between chestnuts and starvation.

The fruit of the Chinquapin is spherical, covered with sharp prickles, and encloses a brown nut, which is sweet and agreeable to the taste, differing from the chestnut in being smaller, and convex on both sides.

The chestnut, though with us a large forest tree, attaining a

height of from fifty to seventy feet, is known in favorable situations to reach a magnitude that ranks it among the monster productions of the vegetable kingdom. One of the most celebrated trees in the world, a representation of which may be seen in our plate as it appeared in 1784 to Howel, from whose *Voyages Pittoresque des Isles de Sicile,* the tree we give was copied. It is known by the name of the *Castagno dei cento cavalli,* or chestnut tree of a hundred horses. The name has arisen from a tradition, which says that Jane, queen of Arragon, on her voyage from Spain to Naples, landed in Sicily for the purpose of visiting Mount Etna; and that, being overtaken by a storm, she and her hundred attendants on horseback, found shelter within the enormous trunk of this rotted tree. The tree appears to consist of five large and two smaller trees, which from the circumstance of the bark and boughs being all outside, are considered to have been originally one. The largest trunk is thirty-eight feet in circumference, and the whole five, measured just above the ground are one hundred and sixty-three feet; it *still bears rich foliage and much small fruit,* though the heart of the trunk is decayed and a public road leads through it, wide enough for two coaches to drive abreast. In the middle cavity a hut is built for the accommodation of those who preserve and collect the chestnuts. By the natives, it is said to be the oldest of trees. The state of decay forbids the usual mode of counting the rings to estimate its growth, so that no exact numerical expression can be assigned to it. Brydone, a traveller who wrote some fifty years ago, in giving an account of Mount Etna, remarks, that from the place he was standing to the great chestnut trees, was not less than five or six miles, through forests growing out of the lava, and in several places almost impassable. He found it marked in an old map of Sicily, published over a hundred years even then; and in all the maps of Etna and its environs, it made a conspicuous figure. He owns he was by no means struck with its appearance, as it did not seem to be one tree, but a bush of five growing together. On complaining to the guides of the imposition, an unanimous assurance was received that by universal tradition, and even testimony of the country, all were united in one stem; that their

grandfathers remembered this when it was looked upon as the glory of the forest, and visited from all quarters; and that for many years past it had been reduced to the venerable ruin he beheld. On examining it with more attention, he found an appearance of five trees being really united into one. He thought the opening in the middle prodigious, and deficient in faith in most respects, could hardly, with the evidence before him, believe so vast a space was once occupied by solid timber. There was no appearance of bark on the inside of any of the stumps, nor on the sides opposite to one another. Mr. Glover and himself measured it separately, and brought it to exactly the same size, two hundred and four feet around. He thinks if it was ever united in one solid stem, it must with justice have been looked upon as a very wonderful phenomenon in the vegetable world, and deserving of the name given it by the guides—glory of the forest. He was told by Canon Recapero, an ingenious ecclesiastic of the place, who had been to the expense of employing peasants to dig around it, that all the stems united below ground into one root. On alleging that so extraordinary an object must have been celebrated by many of their writers, he was assured that it was, and produced many examples.

In some parts of Britain it thrives well, and there are authentic anecdotes of many very large ones in various parts of England and Ireland. Nor is it confined, remarks one of their writers, to the southern parts of the islands, for there is one in a garden in Rosshire, which measures at least fifteen feet in circumference, and which, only a few years ago, showed no signs of decay. Nor is it by any means a slow-growing tree; for in the Kensington Gardens, where it has been planted along with elms and other trees of very inferior timber, it equals them both in height and diameter. If the symptoms of decay that are apparent in some of the trees, of which the age is known not much to exceed a hundred years, are to be taken as evidence of the general failure of the tree, and not of its being in a situation indifferently adapted to it, we should be led to question the great antiquity which has been assigned to some of the chestnut trees in England. The lives of trees must, however, like those of other living beings, vary

with the situation in which they are placed; and the immense size of the celebrated chestnuts must lead us to assign to them a much longer duration than belongs to some others of the same species. Though none approach the size of the giant of Mount Etna, there are many immense trees in England, one in Gloucestershire particularly, in the hollow of which was a pretty wainscoted room, enlightened with windows, and furnished with seats. The great chestnut tree at Tamworth, in the same county, had dimensions and a reputed age belonging to no other tree in England. It was planted in the days of the Saxon Egbert; was a boundary mark in the reign of Stephen; and bore fruit abundantly in 1788, having in 1720 measured thirty-one feet round, at six feet from the ground. To complete this article, we must add the emblem in floral language of the chestnut, which is, DO ME JUSTICE, in consequence of some who might, unacquainted with this beautiful tree, neglect its fruit from the rough appearance it presents.

Introduction to Botany.

WE commence our introduction on a new plan, reversing the order in which the science of botany has been heretofore presented, as we find it requires more than ordinary pains, in the investment of this department with interest, to ensure the attention we wish; and will, therefore, begin with the lowest series in the vegetable kingdom, gradually rising in successive articles to the highest.

Lindley remarks, that the lowest of all the tribes of plants are the SEA WEEDS—ALGÆ and their allies; he thinks the link between the Animal and Vegetable kingdoms, is formed by those productions which inhabit water exclusively, appearing at one end of the scale of their developement, in the form of enormous Fuci many fathoms in length, and at the other merely simple bladders sticking together in rows. Their reproductive organs

are of the simplest kind; the most complete organization have the spores or seminal germs stored up in peculiar receptacles, while in others they are distributed vaguely through the whole substance of the plant, and start into life when liberated from their rest by the destruction of the individual that generated them. In the *Laveis*, whether of fresh or salt water, they lie clustered in threes or fours in the substance of a green membrane; in the true *Confervæ*, they are nothing but granular matter, locked up in little transparent tubes. It is of a vegetation of this latter kind that consists the green slimy patches seen floating in the water, or adhering to stones and rocks, from which the water has receded. What is most remarkable in them, is their approach to the nature of animals, an approach that is not only indicated by the apparently spontaneous motion of some of the kinds called *Cscillatoria*, but in a much more unequivocal manner by other kinds, if we can believe the concurrent testimony of several French and German botanists. No one has investigated the subject with more unwearied assiduity, than Mons. Gaillon, who tells us (according to Lindley's translation) that on the rocks found at low water mark, on the coasts of Normandy and Picardy, there grows a production called *Conferva comoides;* it consists of fine brownish yellow threads, collected in the form of a hair pencil, half an inch or an inch in length, and at low water spreads over the surface of the little round calcareous stones to which it gives something the appearance of a new-born child. These threads are loosely branched and are finer than the most delicate hair; the plant owes its apparent solidity to the clustering and entanglement of many such threads. Viewed under a microscope that magnifies three hundred diameters, the threads seem to be rounded, slightly compressed, and about as large as fine pack-thread. They are of a mucous nature, and contain immersed within their substance a number of small yellowish bodies, which look at first like dots, afterwards become oval, and end in acquiring something the shape of a radish, having the ends transparent and the centre marked by a patch of yellowish matter. If they are at this time separated from the mucous in which they are packed and pressed like herrings in a barrel, they may be seen moving, expanding and contracting,

advancing gravely and slowly, retreating in like manner, altering their direction, and finally possessing a spontaneous incessant voluntary motion. These little creatures, which are at most not the 1000th. of an inch long, and at the smallest hardly exceed the 5000th. when once separated from the thread that contains them, fall down in countless multitudes, in the form of a chocolate brown deposite on the neighboring rocks. Once there, they distend and emit globule, of colored particles, which are evidently their fry. Each particle gains motion and volume, and the little globular mass, lengthening and branching, reproduces by the developement of the germs that are collected together, the long green pencilled appearance, which has led botanists to consider this being a plant.

In another production, continues Lindley, still more astonishing circumstances have been observed. The *Ulloa bullata*, appears to the naked eye, a thin green membrane, within which the microscope reveals a number of green granules arranged in fours. Let this membrane be kept in quiet water, and at a high atmospheric temperature, and the granules may be seen under a powerful microscope, to present at their surface certain convexities and depressions which are the effect of the repeated contraction and distension, of these granules. If they are carefully watched for several days, the granules will be seen to be reciprocally displaced; after a certain time they separate from the membrane, and may then be perceived to have a rapid and regular movement, as if in chase of each other; cool with a drop of water that in which the granules are floating, and their motions will become slower, they will attach themselves by some part of their circumference, and will acquire a swinging motion from right to left, and from left to right. In this sort of imperfect reeling and twirling, one sees the granules approach in pairs, just touch each other, retreat, approach again, and glide away to the right or left, staggering as it were and trying to preserve their balance; at last instead of pairs, four combine to execute the movements of the dance. Imagine the field of the microscope covered shortly after, with a hundred of these animated globules, whose diameter is not in reality more than the 4000th. of an inch, chasing each other, retreating and intermingling as if executing the mazes of a fantastic reel, and one

of the most curious spectacles the microscope exhibits may be observed. When great numbers of the granules are collected, the motion ceases; they then collect in fours, and form a new membrane, and in this state are considered by botanists the kind of vegetable we have named.

We have now come to a point in which the want of analogy between the Organic and Inorganic worlds, is distinctly brought before the mind. As we descend in the scale of the vegetable kingdom, instead of approaching minerals, we verge on the animal! The nature of the Living principle of plants, and the manner in which it differs from the forces of Chemistry and Mechanics, is perfectly exemplified in the history of its creation, Gen. 2. 5. And God made *every plant* of the field, *before* it was in the *earth*, and *every herb* of the field *before* it *grew*. Dry land and seas, by this time were divided, and the forces of the inorganic world in full operation. These forces are called the PULLERS DOWN OF NATURE. Exposed to their influence, mountain and hill crumble into dust; and owing in like manner to their agency, volcanoes and earthquakes destroy cities and swallow up nations; a series of actions due probably to the shape of the ultimate atoms, which fitting into each other in different ways, occasion perpetual change. But on the third day, a new set of powers, a controlling influence, the BUILDERS UP OF NATURE appear. They were created in kind and degree, different from matter, yet only manifest their presence to us in connection with it, our natures while enclosed in clay, being too gross to perceive their existence, except by the phenomena which they occasion. So far from allowing the atoms of matter to unite according to their affinities—which would soon destroy nature—they exercise a most despotic sway, controlling them to the last. The chemical and mechanical forces are in perfect subjection while life remains, but the moment it departs, dust returns to dust, by the commencement of their usual work of destruction, and most of the body vanishes into air. A beautiful example of this opposition is shown by seeds, which are the simplest independent forms of the union of the life-power with matter. Take two of

these, and having destroyed the vitality of one of them by passing an electric spark through it, place both in warm and moist earth. The dead seed surrounded by all the conditions favorable to its decomposition, becomes speedily resolved into its native elements, while the living one makes slaves of its enemies, rapidly sprouts up amid the surrounding desolation, and hangs out its flowery banners as tokens of victory.

And now after an explanation relating to the meaning of the word SPORES, we will be enabled to pass on to the Fungi. Spores are exceedingly minute oval grains, in which the power of increase resides; every one of them will form a new plant, and consequently they are analagous to seeds, but not resulting from the action of pollen upon a stigma, which action is necessary to constitute a real seed; they are only the representatives of these organs among flowerless plants. The spores are contained in hollow seed-like bodies, called THECÆ. Most of us know something of the Fungi tribe, from its containing the common eatable Mushroom, so much used in catsup, though now in the decline, in consequence of the preference given to the Tomato. Of this natural order, it has been shown that no less than 2000 are inhabitants of the United States. They vary in organization from simple cells that hardly adhere to chains of cells that resemble a necklace, thence to hollow balls infinitely minute, that are generated in the living substance of leaves and stems, which they afflict under the names of mildew or blight, these again developed into subterraneous masses of cellular substance, such as the Trufle, and finally arrive at their most perfect state in the Agaric, or Mushroom that we eat, and in the Boleti which grow like huge fleshy excrescences on the trunks of trees, or project from their trunks, in long and ugly lobes, which have in one case been compared to the claws of some gigantic demon.

Lindley, in explaining the developement of the most perfectly formed Fungus, the VEILED AGARIC—AGARICUS VOLACEOUS, goes on to say that in the beginning the plant is nothing but a thin layer of cobweb-like matter, spreading among old tan; by degrees, on the surface of the cobweb-appear little protuberances of a whitish color; they gradually lengthen, and acquire a sort of

stalk, and up to a particular period consist of only a fleshy mass of fibres, and minute cells; if they are cut through at that time in a perpendicular direction, they present one uniform face. But in a short time, a minute cavity is formed in the fungus at the thicker end, within which a sort of cap is gradually elevated upon a stalk; the cap and stalk keep progressively enlarging, and stretching the skin within which they are enclosed, till at last the skin cracks; the cap and its stalk rapidly enlarge, and tear a way through the skin, and at last bursts forth into light, a perfect mushroom, with numerous cinnamon brown gills or LAMELLA, radiating from the stalks underneath the cap, and concealing the theca in which the pores are laid up. When the mushroom has gained its full size, its stalk is surrounded at the base by a thick fleshy sheath, called the VOLVA, or *wrapper*, which last, from what has been seen of its gradual progress, is nothing but the remains of the skin, within which the fungus was formed. A late writer remarked, that as mushrooms often spring up in great abundance after rain, they were on that account shaped like umbrellas.

Owing to the general desire expressed for information about this order, we will describe some of the principal genera, for illustrations of which we must of course refer to the plate; and first, the AGARICUS CAMPESTRIS,—FIELD MUSHROOM, has a short solid and white stem, marked a little below the cap, with a prominent ring, the remains of the curtain which covers the gills in their early stage. The cap is at first white, regularly convex, and a little turned in at the edge; as it advances in growth, the surface becomes brown, scaly and flattened. The flesh is white, firm and solid; the gills are loose, reaching to the stem on all sides, but not touching it. When young, these are of a pinkish red, but change to a livid color about the same time the cap alters its form, the upper surface also changing color; this circumstance, together with its possessing a pleasant smell, distinguishes it from the slimy and fetid dark-gilled toad-stool, with which it might be confounded. They should always be sought for in dry and rich pastures, and mostly about September and October. It has been found by fatal experience, that some species which are not poisonous when they grow upon an open and dry champaign, become so

when they meet with stagnant water, putrescent plants, and dead insects.

In point of size, there is considerable variation, from two inches in diameter upwards; we have an account of a mushroom that was gathered, which measured thirty-four inches in circumference, and weighed one pound; another measuring almost thirty inches, weighed one pound one ounce; and a third, fifty-four inches in circumference, with a corresponding stem to support it. A writer, remarking about their extremely strong powers of vegetation, tells us, that some men in the Isle of Wight, a few years ago, observed a large stone rising considerably at the interstices, and upon removing the pavement to discover the cause, found it to be occasioned by a mushroom, the vigorous efforts of which to increase upwards had forced the stone from its proper station. They are sometimes found in great abundance, and under circumstances and situations very unexpected. Some cultivators of a patch of potatoes in Derbyshire, England, proceeding to dig up their crop, found to their surprise, that a large quantity of fine mushrooms had sprung up from among their potatoes, and in a small space of time, they gathered at least five pecks. The ground, previously to planting the potatoes, had been dressed with round scrapings, and with a small quantity of moss taken from off an old building. Though wild mushrooms from old pastures are generally considered more delicate than those obtained by garden culture, yet this last is extensively carried on. The spawn is a white fibrous substance, running like broken threads in any nidus, which is filled to nourish it; this scattered on beds dressed with stable manure, and skilfully managed, produces plentiful crops of mushrooms.

The mushroom is chiefly used to communicate its peculiar flavor to ragouts, or served up by itself with rich gravy. The button, or fleshy part, is the only portion employed, the stem, gill and skin being removed. One very general use, as we have mentioned, is converting them into the sauce called catsup. For this purpose they are laid some time in salt, by which means a juice is extracted, to be afterwards boiled with spices. Mr. T.

Bridgeman of this city, a gardener of justly deserved celebrity, says that in order to ascertain whether what appear to be mushrooms are of the true eatable kinds, sprinkle a little salt over the inner or spongy part; if in a short time after they turn yellow, they are unwholesome; but if black, they may be considered as genuine mushrooms. The generic name Agaric, is derived from Agaria, a town in Asia, famous for the preparations they made from this article. We find it used from the earliest times for many purposes, a description of which will of course be found by those interested in the matter, under the head of Medical Department.

Medical Department.

Whatever those circumstances may have been, that by their peculiar agency served to lay the first foundation of Practical Physic in the world, it were now perhaps, amid the obscurity of distant ages, vain to inquire. What ever theywere, however, whether experiments blindly undertaken under the anguish and pressure of disease, discoveries afforded by accident, or as some have alleged, observations made by men, of the instincts of the inferior animals, certain it is that this branch of healing appears of the most ancient date, and to have existed in times and countries the most remote from civilization. No fact in the history of human knowledge seems better attested than this. A proficiency in the arts of practical physic, far beyond the humble scope of their other attainments, ever forms a curious, but unfailing trait in the character of savages.

With regard to the examples afforded by the instinct of animals in teaching men, the editor would remark, that much knowledge has undoubtedly been derived from that source. Among many instances which he might take to prove this position, he will select a few convenient for his purpose, from Dr. Good, who quotes from Bruce, in relation to the fact that the Arabs, in the kingdom of

Sennaar, handle and play with at pleasure, the most venemous serpents, acquiring an exemption from the mortal consequences attending the bite of these animals, by chewing a particular root, and washing themselves with an infusion of certain plants in water. Mr. Bruce has given an account of several of these plants, some of which seem only capable of acting against the power of the serpent, others only against that of the scorpion, and a third sort against both. And in either instance, when they secure against the bite or sting, and thus operate as a preventive or prophylactic, they also secure equally against the poison when introduced into the system by a wound, and thus operate as an antidote. The tribes in our southern continent also obtain by the use of peculiar plants, the same powers. One of the most satisfactory accounts of this singular fact is contained in a memoir, drawn up in 1791, by Don Pedro Vargus, a native of Santa Fe, which details a long and accurate list of experiments instituted in order to ascertain it. He tells us the plant chiefly employed by the American Indians, is denominated in this part of the world, *vejuco de quaaco*, or *quaaco-withey* (*Ophior hiza Mungos*,) from their having first observed that the bird of this name, or as Catesby calls it, the serpent hawk, usually sucks it before it battles with poisonous serpents, and then attacks them without mischief to itself. Prepared by drinking a small portion of the juice of this plant, and inoculating themselves with it also, by rubbing it upon three small punctures in the hands, breast and feet, and thus impregnating the body with its virtues, Don Pedro himself, and all his domestics were accustomed to venture into the open fields, and fearlessly seize hold of the largest and most venomous serpents. It was scarcely ever the animal thus charmed had power to bite, and when it did so, the wound was slight and of no consequence. Mr. Acrell, in a paper written by him, after mentioning the same plant, tells us the Senega is possessed of a like power. Of the truth of these facts, thus confirmed by the most trusty historians and travellers, from all parts of the world, there can be no doubt; and it adds to the facility of believing it, to find animals besides men possessed of a similar power. The

Ibis of Egypt, whose chief food is poisonous snakes, though it appears to open its battles with them without preparations of the preventive kind, retires to the field, if wounded, to the plant, which it knows will serve as an antidote, and immediately renews and continues it till the victory is won.

A common instance is taken from the dog, which when sick, is observed to eat a quantity of prickly grass, an expedient which seldom fails to answer all the purposes of an emetic. Another is afforded by the goat. An Arabian shepherd, having observed the goats of his flock, as often as they broused upon the coffee fruit, to skip about and display other signs of intoxication, was induced to try the berry upon himself, so as to discover its exhilarating quality. The apes of Abyssinia are reported to have by trials on themselves, first exhibited to men the laxative properties of the Cassia Fistula.

Debarred from the improvements of foreign intercourse by immense seas and continents interposed betwixt them and more civilized states, the Americans might be considered as affording a spectacle of what the human mind is capable of attaining, when left to its own efforts in the natural progress of men from rudeness to refinement. Amidst the general barbarism of America, however, Dr. Miller remarks, that its acquirements in practical physic were observed to be prominent and remarkable. The navigators who first visited the shores of the New World, describe the state of its medicine in terms of respect and admiration, and assert, in one voice, that not only had the aboriginal inhabitants rendered themselves acquainted with a copious store of powerful simples, but had even acquired the more difficult art of applying them with skill and precision to the removal of numerous and formidable maladies. From the narratives of those voyagers who have supplied the most accurate accounts of the American countries, innumerable facts might be collected in proof of this assertion. But, perhaps, the best proof of the medical skill of the Americans is to be deduced from another circumstance less liable to error, the frequent adoption of their remedies by practitioners of more polished nations. The obligations of physic to this source may be pronounced at once numerous and important.

For some of the choicest treasures of the *Materia Medica*, it is well known the natives of the Old World are entirely indebted to those of the New; and the most obstinate diseases of civilized Europe have frequently yielded to the powerful simples originally culled by savage hands amidst the wilds and forests of America. The list of valuable remedies derived from us is not a little ample. Thus two of the most commonly employed emetics and purgatives, *Ipecac* and *Jalap*, come solely from our quarter of the world. The remedies for producing perspiration—diaphoretics, the gum and wood of *Guiacum*, *Sarsaparilla* and *Sassafras*, acknowledge a similar origin. For tonics, we have the various species of *Peruvian bark*. Among the bitters, *Quassia*, *Excelsia*, *Amara* and *Semirouba*; and we might continue through a long catalogue of worm medicines, diuretics, balsams and resinous substances, &c., &c., almost without end. It is well known that Cortez, when dangerously ill, and given over by his own physicians, was induced by dint of repeated solicitation to allow the Mexican dealers in simples to attend him, and that through their means he was rapidly and perfectly cured. And history tells us a similar anecdote of the Spanish captain, Gonsalvo Ferrand.

Various barbarous nations in the Old World discover a proficiency in the *Materia Medica*, no less remarkable than that exhibited in the New. Among those of Africa deserving this praise, may be mentioned many tribes on the western coast, and on the eastern, the islanders of Madagascar. One of the native remedies of the Kroo coast, the astringent and sweetish bark of the Rondeletia Africana, employed among the Negroes for dysentery, was found by a physician on the station to be extremely serviceable in diarrhœa, dysentery, ague, common fever, and sore throats. Vol. viii. of the *Histoirie Générale des Voyages*, contains an ample list of medicines in use among the Madacassees, when first visited by the Europeans, which list proves their acquaintance with the *Materia Medica* to be deep. As examples of Asiatic rude communities distinguished for the same species of knowledge, may be noticed the Sumatrians, the people of Celebes, together with those of the Philippine Archipelago. Regarding the first, a long list of simples is given by Marsden. Speaking of other

advances in practical medicine, that learned and respectable author observes that the Sumatrians have a degree of knowledge in botany that surprises a European. They are in general, and at a very early age, acquainted not only with the names, but the qualities and properties of every shrub and herb amongst that exuberant variety with which these islands are clothed. They distinguish the sexes of many plants and trees (the Papa, or Calackee, for instance), and divide several of the genera into as many species as our professors. Of the Facou, or Fern, I have had specimens brought me of twelve varieties, which they told me were not the whole, and to each there is a distinct name.

> "There thou shalt cull me simples and shalt teach
> Thy friend the name and healing powers of each;
> From the tall Bluebell to the dwarfish weed,
> What the dry land and what the marshes breed;
> For all their kinds alike to thee are known,
> And the whole art of Galen is thine own,
> Ah, perish Galen's art, and withered be
> The useless herbs that gave not health to thee!"

The Anemones, in common with the other genera in the natural order Ranunculacea, to which they belong, are, in a recent state, highly acrid, and possessed of rubefacient properties. The *Nemorosa*, which is common to both Europe and the United States, possesses these qualities in a high degree. It acts as a poison to the cattle who may chance to eat it, producing bloody urine, and convulsions that often terminate in death. The bruised leaves and flowers are said to cure tinea capitis, when applied to the part. Tinea Capitis is the *Scald-head* of children; it is characterized by small ulcers at the root of the hairs of the head, which produce a friable white crust. The inhabitants of Kamskatka, it is believed, poison their arrows with the juice of the Nemorosa. The Pratensis and Pulsatilla are very analagous species, and are employed for similar purposes. The former came into use, on the authority of Baron Storck, who recommended it as an effectual remedy for most of the chronic diseases affecting the eye, particularly amaurosis, cataract and opacity of the cornea, proceeding from various causes. He tells us he found it of great use in syphilitic nodes, nocturnal pains, ulcers, caries, indurated

glands, suppressed menses, melancholy and palsy. In its recent state it has scarcely any smell; but the taste, when chewed, is extremely acrid, and corrodes the tongue, and every part of the mouth it touches. Much has been said in favor of the Pulsatilla, in relation to its efficiency in obstinate diseases of the skin, and in hooping-cough. Storck employed the herbaceous part of the plant made into an extract, of which he gave at the commencement of his treatment, one or two grains daily, gradually increasing, when he found he could proceed with safety to as many as twenty and twenty-five, and in some cases even thirty-five. Large doses would produce nausea and vomiting, sometimes griping and looseness of the bowels, and very seldom act as a diuretic. None of the Anemones are of much importance in a medicinal point of view, their uncertain and acrid properties preventing their use, when better articles can be procured.

Hooper remarks that much has been written on the medicinal properties of tea; in its natural state it is a narcotic plant, on which account the Chinese refrain from its use, till it has in a measure been divested of this property by keeping at least twelve months. As we procure it, good tea is a stringent and gentle stimulant, and in its finer varieties, it exerts a decided influence upon the nervous system, and when drunk in moderate quantities, with sufficient milk and sugar—which articles should never be omitted in its use—it produces a temporary exhilaration, and a feeling of complacency. We have known it to act on some persons, so as to produce unnatural wakefulness, preventing sleep for many hours after its exhibition, and again on others so as to ensure refreshing slumbers. Taken too copiously, or by those whose constitution seems to dislike it, it is always apt to occasion weakness, tremor, palsies and various other symptoms arising from narcotic plants, and is certain, as a general rule, to aggravate hysterical and hypochondriacal complaints. The unpleasant nervous and dyspeptic symptoms it sometimes occasions, are necessary consequences of over-excitement of the stomach and brain. Tea has been supposed to possess considerable diuretic and sudorific or sweating virtues, which, however, depend more

on the quantity of warm water employed as a vehicle, than the amount of the tea itself. Green tea being possessed of more narcotic properties than the black, should, as a matter of precaution, be avoided by dyspeptic individuals, and those whose nervous systems are easily excitable. It is sometimes given with advantage in cases of slight diarrhœa, and in the relief of nervous headache; for the latter purposes the green tea is the best. In China, an extract is made from it, which the native physicians exhibit in fevers. Lastly, as the infusions of these leaves are the safest refreshment after undergoing great bodily fatigue and mental exertion, they afford an agreeable beverage to those who are exposed to cold weather, at the same time tending to support and promote perspiration, which is otherwise liable to be impeded.

The bark of the Chinquapin is the part of the tree used in medicine. It possesses astringent and tonic properties, and is consequently used in the cure of intermittent fevers; that from the tree is best. An ounce of the bark has a pint of hot water poured on it, of which, six hours afterwards, a tablespoonful is taken four or five times a day during the intermissions of the attacks. The powdered bark is given in doses, varying from three to fifteen grains, three times a day. Dr. Wood in his Pharmacopœia, says it has no particular virtues to recommend it, and is undeserving even a secondary place in the list of remedies.

Some of the sea-weed species, more especially the *Fucus Vesciculosus*, were used as an assistant to sea-water, in the cure of disorders of the glandular system. Burnt in the open air, and reduced to a black powder, it formed the Ethiops Vegetabilis, which, as an internal medicine, is equal to burnt sponge; but neither, in their palmiest days, were worth much, and the fortunate discovery of Iodine in our time, has superseded all such preparations.

Many species of mushroom are known to be highly poisonous, but differ from other noxious vegetables in this, that their poison cannot be separated by boiling, or even distillation. The Ostiaks, a Siberian tribe, make a preparation from the *Agaricus Muscarius*—Bug Agaric, so called from its destroying bugs, which

will kill the most robust man in twelve hours. Haller relates that six persons of Lithuania, perished at one time by eating this kind of mushrooms, and that in others it often caused delirium. It was formerly applied as an escharotic to ill-conditioned sores and ulcers. The *Pepper Mushroom—Agaricus Piperatus*, has also when freely taken, produced fatal consequences. When this vegetable has even lost its acid juice by drying, the caustic quality still remains. The Russians, during their long fasts, live entirely on mushrooms, and are often thrown into violent convulsions in consequence. Tyas recommends that before using them, they should be exposed to the heat of boiling water; this will ascertain their quality, and if they are not of a good kind, the perfume will be evaporated. We are directed to masticate freely all the eatable species before being taken into the stomach, as this lessens greatly the effect of poisons. When accidents of this kind happen, vomiting should be immediately excited, and then the vegetable acids should be given, either vinegar, or the juice of lemons or apples, and when the system begins to grow weak, ether, and the usual anti-spasmodic remedies, exhibited at once

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Biographical Department.

CHARLES LINNEUS.

Nicholas Linneus, the father of the subject of our sketch, was a minister of the parish of Stenbrohult, noted not only for his unassuming worth, but great acquirements in the study of Natural History. His collection of plants, birds and minerals, taking into account his limited means, being very considerable; and as a matter of course, his son Charles, who was born in 1707, became at an early age enamored with similar pursuits; so much so, that they occupied his thoughts to the almost entire exclusion of every thing else. When scarcely four years old, he understood his father who at a rural party, expatiated on the distinctive properties of some plants that were growing around them; and

so earnest was the attention he bestowed, as to remember, he informs us, ever afterwards, this first botanical lecture.

He appears to have had a singular inaptitude for studying languages, though as he was sufficiently versed in Latin—an indispensable acquirement for a man of learning before the nineteenth century—it is probable he might, if willing, have mastered them: he carelessly mentions in his diary the fact, that in all his travels he learned no other language than his own, not even Dutch, though in Holland three years, and yet found his way everywhere well and happily. Still ignorant of the classics at the age of nineteen, his tutors were discouraged, and plainly told his father, who was educating him for the church, that he was an incurably stupid dunce, advising the pastor to apprentice him to some easy mechanical business. The extreme carelessness he evinced in the matter, which in reality arose from intense thought, confirmed the family in the truth of this opinion, and such would have been his fate, had not his great powers of practical observation and passion for studying Nature, attracted the notice and admiration of Rothman, a celebrated physician and lecturer on natural philosophy, who recommended Charles's studying medicine to the mortified Nicholas; the advice was adopted, and Rothman gave him private instruction in several branches pertaining to the science, more particularly to the favorite department of both-botany.

His scanty finances proved a source of very considerable embarrassment for some time; yet the ardor of youth and the love of study buoyed him on. Some assistance he was enabled to render Dr. Celsius, professor of divinity at Upsal, procured him the patronage of that distinguished savan, and he was thereby enabled to pursue his studies to more advantage. From this time he published many papers on scientific subjects, which were read with much interest, and drew on him the attention of the philosophers of Europe. In 1738, he was appointed to give lectures in the botanic garden, and began to compose some of those works by which he rendered his favorite science more philosophical and more popular than it had ever been before. Two years after-

wards, in the spring of 1732, he received from his Academy a commission to travel through Lapland, under the royal authority. In this journey he tells us of his slender provision of clothing, and of his riding sometimes on horseback, sometimes walking on foot, in which last mode of journeying he visited the Lapland Alps; he descended to the coast of Norway, returned by Tornea to Upsal, completing his tour by the 10th of October, having journeyed more than four thousand English miles. Of this journey he subsequently published a very interesting account, which raised him still higher in the estimation of the literary world. This was not the only respect in which it was advantageous to him; for, ever observant and studious, he completely learnt the art of assaying metals, and on his return, communicated his knowledge to the world in a series of lectures, the first of the kind ever delivered at Upsal. We are told that he found at Lyksele, May 29, while on this tour, the elegant and rare, though humble plant, then called the Campanula Serpyllifolia. On examining it attentively, he discovered that the structure of the fructification did not correspond with that of the Campanula genus, and therefore formed a new one, which his friend Grotius, at his request, made known to the world under the name of Linneæ.

In consequence of the jealousy he excited at Upsal, a system of intrigue was carried on against him, which resulted in his departure from the place. Deprived of this means of subsistence, he directed his energies to the furtherance of his knowledge in mineralogy, by visiting the mines in Sweden, giving the result of his observations in a course of lectures, in 1733, at Fahlun. Having by this means accumulated about sixty dollars, he started on his travels to see the world, and obtain a doctor's degree. He took his M.D. at Harderwyck in 1735, advancing in his inaugural dissertation the strange hypothesis, that intermittent fevers are owing to particles of clay taken in with the food, and obstructing the minute arteries.

Soon after graduating, he published the *Systemæ Naturæ*, a work which he had the pleasure of correcting and enlarging

through a great number of editions. In Holland, he contracted an intimacy with Clifford, an opulent banker, through whose generosity he was enabled to visit England, taking with him letters of introduction, one of which we will copy:

"*To the Illustrious Hans Sloane,*

"*Principal Physician to the King.*

"H. BOERHAAVE.

"Linneus delivers this to you, being perfectly worthy to see you, worthy of being seeing seen by you. He who shall see you together will perceive a brace of men, to which the world can scarce exhibit a fellow. Acquaint yourself with the man whom I know well: you will find him worthy of your friendship, worthy that you should give your treasures to him. He visits you that he may see them; and that he may see them is my most vehement desire, which if there is faith among men, I shall obtain. Farewell, excellent sir, the ornament of your age and country.

"Leyden, 1736."

Sir Hans Sloane in this, as in many other respects, proved himself a great little man, and treated Linneus with marked neglect, who becoming sick soon after from a severe intermittent acting on a constitution impaired by intense application, was seized, when somewhat recovered, with an irresistible desire to visit his own country. He tells us he would never have returned, had he not been in love. On arriving in 1738, he settled at Stockholm, where his reputation procured him a good medical practice, and the appointment of physician to the navy, as well as lecturer on botany and mineralogy; a literary society was also established, of which he was the first president, and by which numerous volumes of transactions have been published. Having now acquired such a degree of prosperity in the world as to induce the father of his betrothed to consent to the measure, he was married in 1739. The following year he was chosen professor of medicine at Upsal, sharing with his former enemy, Dr. Rosen, the botanical duties; he was made secretary soon after, doing on some public occasions the honors of the university; and, besides this, was a member of every literary society of any importance in foreign countries.

He had now reached the utmost bounds of his ambition, and keenly alive to domestic enjoyment, confidently expected a large share of it; but his marriage proved most unfortunate; every day the disposition of his wife became more developed; they had an only son, whom, as well as her husband, she hated, making the lives of both miserable by her misconduct and petty persecutions. This, perhaps, drove him to seek solace in study. In 1749 he sent forth a systematic treatise on the Materia Medica, and two years after, his Philosophica Botanica, composed during a severe fit of the gout, in which disease he found immediate relief and permanent benefit from the consumption of great quantities of strawberries. In 1751, much favor was shown to Linneus by Louisa Ulrica, sister of Frederick of Prussia, and Queen of Sweden. She and her consort, Adolphus Frederick, had some taste for the study of natural history, and employed him to arrange a collection of shells and insects; while so employed, he was frequently honored with the company and conversation of their majesties. The queen interested herself in the education of his son, and allowed Linneus his habitual indulgence of smoking, even in her royal apartments, that he might continue his labors with more satisfaction to himself. The same year his immortal work came out, the Species Plantarum, which was received with such universal acclamation, that the order of the Polar Star, in 1753, was received from the hand of his sovereign; an honor never before conferred for literary merit. The king of Spain, desirous of establishing him in his kingdom, invited him to settle at Madrid, with the offer of nobility, the free exercise of his religion, and a splendid botanical appointment; most certainly a high royal compliment. He declined it, however, from patriotic motives. Sweden could not be outdone by Spain, and in 1756 he was raised to the rank of nobility, under the name of Von Linneus.

In 1763 his son was permitted to assist him in public, which allowed him time to publish his Genera Morborum, and three years after, his Clasis Medicina. His medical lectures, though too theoretical, were much esteemed; but, he had declined general practice on his establishment at Upsal. Temperate and regular

in his habits, he retained full possession of his faculties until after sixty years of age, when his memory began to fail. In 1774 he had a fit of apoplexy, and three years afterwards another attack. He died in 1778, aged seventy-one. A medal was struck by Gustavus III., the reigning sovereign, to his honor, who also attended to hear the eulogy by Black, but also testified his sorrow in a speech from the throne. Five years after this, his only son, who had succeeded to the professorship, was laid by his side, the family coat of arms broken over them, and their mingled ashes strewed with flowers. And thus terminates the name and history of him who was familiarly known throughout the world as the Northern Light and Prince of Naturalists. Science, indefatigable in her researches, to honor her affectionate children, has derived the name of Linneus from the Lime, or Linden tree. About the year 1790, the celebrated Linnean Society was founded in London, of which Sir James E. Smith, M. D. was the first president, and who purchased from the widow of Linneus, his entire collections, by the revision of which many important mistakes have been corrected in classification.

Hyacinth.

The Hyacinthus Orientalis—Garden Hyacinth, is in the class Hexandria, Order Monogynia, and Natural Order Liliaceæ. Its generic characters are:—Perianth bell-form, regular, six-cleft. Three nectariferous pores at the top of the germ. Stamens inserted about the middle of the segments. Cells of capsule generally two-seeded. The specific characters are:—Perianth funnel-form, half-six-cleft, ventricose at base. The Lily tribe, to which it belongs in the natural classification, is distinguished by its regular perfect flowers, which have three sepals and three petals, exactly alike in color and shape; a perianth rarely of four pieces. Generally six, rarely four, stamens inserted into the sepals and petals.

Ovary three-celled. Stiles joined in one, though with an often three lobed stigma. The fruit capsular or fleshy, with several albuminous fleshy seeds in each cell.

Lindley remarks, that the leaves and flowering stems of this plant rise from a subterranean roundish fleshy body, formed of scales wrapped closely round each other. The scales are of the same nature as those of a bud, namely, the rudiments or bases of leaves; and the body itself, called a Bulb, is a kind of under-ground bud; hence you will perceive that when one talks of Hyacinth roots, which are placed in glasses, an incorrect kind of language is made use of. In one respect the bulb differs essentially from a bud; it is not a perishable part, intended merely as a protection to the young and tender vital point, from which new growth is to take place; this indeed is a part of its object, but it also serves as a copious reservoir of nutritive matter, upon which the young leaves and flowers feed. On this account its scales are not thin and easily withered up, as in a common bud, but succulent, and capable of retaining their moisture during long and severe drought. In this we see a direct manifestation of the all-protecting care of the Deity; for bulbous plants are generally natives of situations which at certain seasons of the year are dried up, and where all vegetation would perish, were it not for some such provisions as we find in the bulb. In places like the hard dry Karroos of the Cape of Good Hope, where rain falls only for three months in the year; in the parched plains of Barbary, where the ground is rarely refreshed by showers, except in the winter, and on the most burning shores of tropical India, beyond the reach of the tide and buried in sand, the temperature of which often rises to 180°, bulbous rooted plants are enabled to live and enliven such scenes with their periodical beauty.

And all about grew every sort of flowre,
To which sad lovers were transformed of yore;
Fresh Hyacinthus, Phœbus' paramoure,
And dearest love. Faery Queen.

The melancholy Hyacinth that weeps
All night, and never lifts an eye all day. Hurdis.

Phillips remarks, that the Hyacinth, so celebrated in the songs of the poets, from the time of Homer to the present day, is made hieroglyphical of play or games, in allusion to the fabulous origin of this favorite flower, which mythologists tell us sprang from the blood of Hyacinthus, a youth greatly beloved both by Apollo and Zephyrus, but who preferring the Sun to the Winds, created a jealousy in the bosom of the latter god, which caused his destruction. Hyacinthus being at quoits with Apollo, Zephyr, unperceived, took the opportunity of revenging himself on his rival, by causing him to become the instrument of the death of their favorite; for whilst Apollo's quoit was in the air, Zephyr blew it from its course towards the head of the unfortunate youth. Ovid gives a slightly different version of the affair, as follows,

A well-poised disk first hasty Phœbus threw,
It cleft the air and whistled as it flew;
It reached the mark, a most surprising length,
Which spoke an equal share of art and strength.
Scarce was it fallen, when with too eager hand
Hyacinthus ran to snatch it from the sand;
But the curst orb, which met a stony soil,
Flew in his face with violent recoil.

As in a water'd garden's blooming walk,
When some rude hand has bruised its tender stalk,
A fading Lily droops its languid head,
And bends to earth, its life and beauty fled,
So Hyacinth with head reclined, decays,
And sickening now, no more his charms displays.

Quick to his aid distress'd Apollo flew,
And round the hero's neck his arms he threw;
But whilst he held him to his throbbing breast,
And all the anguish of his soul exprest,
His polished limbs, by strange enchantment's power,
Shoot into buds and blossom into flower,
His auburn locks in verdant foliage flow,
And wreaths of azure flow'rets shade his brow.

Nor are the Spartans, who are so much famed
For virtue, of their Hyacinth ashamed;
But still with pompous woe and solemn state,
The Hyacinthian feasts they yearly celebrate.

An annual solemnity, called Hyacinthia, was held at Amyclæ, in Laconia, in honor of Hyacinthus and Apollo, which lasted three days, the first of which was observed by affected mourning

for the death of Hyacinthus, during which time none appeared with their usual garlands about their heads, and they refused to eat bread or to sing in honor of Phœbus; but the two following days were spent in the games customary at ancient festivals, even the slaves were liberally entertained during this period, and the altars of Apollo were loaded with the accustomed victims. Homer mentions this flower amongst those which formed the genial couch of Jove and Juno, in the fourteenth book of his Iliad.

> Thick new-born Violets a soft carpet spread,
> And clustering Lotus swelled the rising bed,
> And sudden Hyacinths the turf bestrow,
> And flow'ry Crocus made the mountain glow.

Crowns of Hyacinths were worn by the young Greek virgins, who assisted at the weddings of their friends. Phillips continues to remark, that some authors suppose the Red Martagon Lily to be the poetical Hyacinth of the ancients, but this is evidently a mistaken opinion, the azure blue color alone would decide; and Pliny describes it as having a sword grass, and the smell of the grape flower, which agrees with the Hyacinth, but not the Martagon. Again Homer mentions it with fragrant flowers of the same season of the Hyacinthus. The poets also notice it under different colors, and every body knows that the Hyacinth flowers with sapphire-colored purple, crimson, flesh and white bells, but a Blue Martagon will be sought for in vain.

The English poets are as profuse in the praise of the Harebell Hyacinth as were the ancients. Indeed one of their writers remarks, that it is hardly possible for a person of poetical imagination, to pass a sloping hedge-row, covered with the azure bells of this their native Hyacinth, mixed as they generally are with the delicate color of the primrose, without having their ideas softened into song. In the time of queen Elizabeth, when the high plaited ruff was worn, by both the gentlemen and ladies, the juice of the bulbs of the plant, was used to make starch, and also to paste books and to fix feathers upon arrows instead of glue. Dioscorides tells us, that this root will procure hair on bald and beardless men. Phillips presumes it was to be used in the manner of glue, as is now practised by our mustached beaux.

Hail to thee ! hail, thou lovely flower,
Still shed around thy sweet perfume,
Still smile amid the wintry hour,
And boast e'en then a spring-tide bloom.
Thus hope, 'mid life's severest days,
Still smiles, still triumphs o'er despair ;
Alike she lives in pleasure's rays,
And cold affliction's winter air.

Had the Garden, or Oriental Hyacinth, says Phillips, been disregarded by the poets, it could not have failed claiming our notice and admiration, by its extreme delicacy of coloring, elegance of form and delightful fragrance, which fit it alike for the garden of choicest plants, or the vase of odorous flowers. Hence, no wonder that Phœbus became enamored of its beauty, and Zephyrus sighed to enjoy its sweet breath—that our artists should invent glasses for the bulbs, and our fair countrywomen should foster them with such care in their saloons. It may be considered as supreme among the flowers of spring, as the Roses are among the flowers of summer ; and their charms have rendered them successful rivals to the Tulips, even in the hearts of Dutch florists. The Hyacinth is a native of the Levant, and grows abundantly about Aleppo and Bagdad, where it flowers naturally in February. Lepechin found it in Russia, not only with purple corollas, but with yellow flowers also. They must have been common in the English gardens prior to 1597, as Gerard mentions them in his ordinary manner, as " kinds of jacints, that had been brought from beyond the seas, some out of one country and some out of others, especially from the East countries, whereof they took their name *Orientalis*." It is probable that these bulbs, and many seeds of Eastern plants, were brought to England during the early part of the reign of Elizabeth ; as about the year 1561, she enabled a company of trading speculators to visit Persia for commercial purposes ; which party was eminently successful, as they also obtained the exclusive privilege of importing all manner of foreign commodities into Russia, and by this support were encouraged to visit the several provinces of the East, more carefully than others could do. The Dutch, who at that period were the greatest florists in Europe, soon turned these bulbs to account; and it is rather

singular, that neither the French nor English should ever have made the attempt of raising flower bulbs for the market; to this day, the rearing of them from seed is but little practised in either country, even in situations offering all the advantages of soil, which the Dutch are said to possess in so high a degree, for bulbous flowering plants.

Phillips goes on to remark, that he is satisfied, that if it should become the practice to raise them from seed more, they would not so soon degenerate, and we should produce much finer flowers of this kind, than those which at present embellish our borders. They would be more perfectly naturalized to our soil and climate, and more interest would be excited in the florists, to rival each other in producing the finest plants of this beautiful flower. It is admitted that five years—the time required to raise these bulbs from seed to a state fit for the market—is a long period for a planter to wait a return; but when once this is accomplished, the succession goes on annually with as much regularity, as a crop of seeds of any description; and when we consider the high prices which bulbs of good varieties fetch in the shops of our seedsmen, it must appear to be a lucrative branch of gardening. The cultivation of this flower receives more attention, and is in higher estimation with Dutch florists at present, than that of the Tulip, to which it certainly is very superior, though the great care of the Dutch is owing to the increased demand from London and Paris, where the roots are sent in large cases and casks, and where three-fourths of their imported bulbs are lost through carelessness after they have flowered, particularly those grown in glasses.

It is calculated that more than one hundred acres of ground are occupied for rearing bulbous plants, principally Hyacinths, near the village of Overeen, in the neighborhood of Haarlem, where the best growers keep about 50,000 bulbs as breeders, and these florists enumerate upwards of 2000 varieties of this flower. The list of one of them gives 800 kinds of the double flower, and 400 of the single kind. Peter Voerhelm was one of the earliest cultivators of the Double Hyacinth; he lived about the beginning of the last century. Previous to this time, the single kind only had

been propagated. This florist named his Double Hyacinth, MARY, but the kind is now lost; his third one was called *the King of Great Britain;* and this last is now the oldest one known, a single bulb of which used to bring the price of a thousand florins, or five hundred dollars; about seventy years back, two hundred English pounds was no uncommon price for a single bulb of a favorite Hyacinth. At the present time, fifty dollars will buy the finest bulbs, and from two to twenty shillings the varied sorts; what are called the common mixtures, are sold at a mere song by the hundred.

The criterion of a fine Double Hyacinth, consists in its stem being strong, tall and erect, garnished with numerous and large bells, each supported by a short and strong pedicle in a horizontal position, so that the whole may have a compact pyramidal form, with the upper flower perfectly erect. The flowers should be large and perfectly double, that is, well filled with broad, bold petals, appearing rather convex than flat or hollow. The flowers should occupy about one half the length of the stem. The colors should be clear and bright, whether plain yellow, red, white or blue; or variously intermixed and diversified in the dye, which is thought to give additional lustre and elegance to the Hyacinth. Strong bright colors are in greater request, and bear a higher price than such as are pale. Under bad treatment, good ones will degenerate in two or three years, but in Holland they have been preserved for nearly a century.

The Hyacinth has a coated bulb, that consists of a number of concentric lamina, like the onion; but its natural history differs as much from this table vegetable in the economy of its nature as it does in its perfume. Every body knows that the bulb of the common onion is exhausted by its flower stem, and that when it has performed its oviparous duties, as ordained by nature, there are no remains of the bulb left. Not so with the Hyacinth; there Nature works in a more complicated manner; for, whilst the stem is sent out of the earth to form its seed, the bulb is forming a new germ, or bud, within the next coat or circle of the laminæ, and thus whilst the flower stem is exhausting the old germ, or heart of the bulb, a regeneration is taking place within the body for the

succeeding year: nor is this all, for as the Hyacinth possesess a viviparous nature also, it throws off perfect plants from its side, beneath the earth. Some varieties do not so readily throw off young bulbs as others, but requires all the nourishment to form their flowers and support the seed vessels. In this case a simple expedient is resorted to; if the variety be scarce and valuable, the base of the bulb is slightly cut or notched in three or four places, which hinders the plant from exhausting itself in the production of a flower stem, and at the same time induces a tendency in the bulb to throw out offsets at the wounded places; and these soon become independent plants, with all the character of the parent bulb.

To raise these flowers from seed is doubly desirous, as it not only increases their number but variety. Plants that have a strong and straight stem and a regular and well-formed pyramid of bells, that are semi-double, should be selected for seed. They should not be gathered until perfectly black and ripe, at which time the pericarpium will appear yellow on the outside, and begin to open. The stem with which the seed is connected is then to be cut off and placed in a dry airy situation, but not in the sun, where it may remain until the time of sowing, which is in October, or early spring. The seeds should be sown in pots or boxes, filled with compost, as will be described. They should be sown as regularly as possible, and then covered with compost, half an inch thick. These pots or boxes should be placed in a warm situation for the winter. They will never require water or other attention, excepting to keep the boxes free from weeds and frost. At the approach of the second winter, an additional stratum of half an inch of the compost must be spread over the pots or boxes, and about the middle of July in the third year, the bulbs may be taken up, dried, and treated in the same manner as old bulbs or off-sets. Some may be expected to flower in the fourth year, and others in the fifth and sixth, according to their strength. The Dutch florists considered it a successful sowing, if they procured four or six good varieties out of each thousand bulbs so raised. Maddock says we must be content if we find one flower in five hundred deserving a name or place in a curious collection; but for ourselves, we should prefer seeing the four

hundred and ninety-nine common varieties, flowering on the parterre at one time, than a single plant of the most curious variety; not, continues Phillips, but that we would wish them to be of the finest kinds, if possible; but in Hyacinths as in Violets, we covet quantity, both to gratify the taste and smell. Those for the house, or that are intended to be sheltered by awnings, should be of the most curious kinds; whilst those of the least attractions may form clumps in the open borders, but where they are in some degree screened from the colder winds by shrubs or taller plants, offsets will bloom the second year, and be tolerably strong the third, if properly treated. They may be planted soon after they are taken from the old bulbs; and it is desirable to form a separate bed for these young bulbs, which should be in an open part of the garden, protected from the colder winds. The bed should be a few inches above the common level of the garden, so that superfluous moisture may run off; and for this end, it is advised that they be of a rounding or convex shape. The bulbs should be covered about two inches deep with the compost. (The compost most esteemed at Harlem for growing Hyacinths, consists of pure white sand, rotted leaves of trees, fine peat earth, and a small proportion of thoroughly rotted cow-yard produce, and this prepared soil renewed annually, after the bulbs are lifted in summer.) The compost in which they grew is removed to the depth of about nine inches, and the subsoil digged over; a new layer of compost, of equal depth, is afterwards introduced; in this the choice bulbs are again planted in the autumn. The compost in which the Hyacinths grew, descends the following year; first to the Tulips and then to the Narcissus, &c., so as to give them all a regular change of soil, adding more cow-yard produce, or more sand, as the nature of the succeeding plants may require.

The first or second week in October is the best time for planting Hyacinth bulbs in the ground, for when planted earlier, they appear above ground in the middle of winter, and if neglected later, the bulbs will be weakened by their natural tendency to vegetate. They should be planted from six to nine inches apart, and it is advisable to place a small quantity of sand beneath each bulb, to prevent the earth adhering closely to them. Mrs. Loudon

says, the most convenient width for the beds is five feet, and the length may be greater or less, at pleasure. Five feet in width will admit of four rows, for the colours of red, white, blue, and yellow, which should be six inches apart between the rows, and the bulbs may be placed at the same distance from each other in the row. The arrangement of colors is according to fancy, but it is a common rule never to have two of a color together. To prepare the bed, dig out the soil to the depth of three feet, and fill it up to one foot above the surface with very sandy loam, mixed with leaf mould, cow-yard produce, or hot-bed dung, thoroughly rotted. This had better be done in September, and in October six inches of the soil may be removed and the bulbs planted; after which the soil must be replaced. To protect the bulbs from too much wet during the winter, the surface of the bed should be gently sloped to each side; and during rainy weather it may be covered with reeds or thatch, in such a manner as to throw off the rain. Thus treated, the plants will bloom in the following April with great vigor; and to have the colors in the greatest perfection, the bed ought to be covered in the flowering season with a tent or awning. But for amateurs, the most convenient mode is to form the bed of such a size as to be contained either in a common cucumber frame, with glass sashes, which may be put on during heavy rains, and also during sunshine; tilting them at both ends, to admit a free circulation of air, and covering the glass with mats, to exclude the sun. Care must be taken to remove the glasses in cloudy weather entirely, in order not to draw up the plants; and for the same reason to take them off every night, when the weather is dry. A common cucumber frame, of twelve feet long and four feet wide, will contain a very handsome collection of Hyacinths, which may thus be grown to the highest degree of perfection, and protected from exterior injury.

When Hyacinths are planted in the flower garden over the projecting borders of shrubbery, they will be found to have a much better appearance when clumps are formed of distinct colors. After fixing on the spot where they are intended to be planted, loosen the earth to the depth of a foot with the spade, breaking it fine, and ta-

king care that the roots of the adjoining plants are cut off, so as not to interfere with those of the Hyacinths. Remove three or four inches of the soil, and then deposit three or four bulbs, one in the centre, and the others round it, so as to form a circumference of about twenty inches in diameter: press the roots firmly into the ground, and cover them three or four inches deep with the soil, if it is a common garden loam, and five or six inches, if it is a light sand. Put in a stick to mark the spot, that they may not be interfered with before they come up, when the bed is being dug over in the spring. In general, no protection from the frost is requisite, for the Hyacinth is very hardy, and chiefly suffers from too much water, from snails, and from a disease called the canker. In heavy clayey soils, a small cone may be raised over the roots, to throw off the rain; but when this is done, the cone ought to be levelled down in early spring, before the plants come up; or, a small gutter may be formed round each circle of bulbs, to drain off the wet.

The principal Hyacinth growers in Holland take up their bulbs about a month after bloom, or as soon as the plants begin to appear yellow and decayed: they then cut off the stem and the foliage close to the bulb, or within half an inch of it, but leave the fibrous roots attached to the bulbs; the bulbs are then placed on their sides on the same beds, with the points towards the North; they are then covered with dry earth or sand, about half an inch thick, in the form of a ridge or cone, and in this state are left to dry or ripen gradually for about three weeks; they are then taken up and their fibres gently rubbed off, after which they are laid in a dry room for a few days, and then cleared from soil or loose decayed coats, and their offsets separated. The bulbs should then be placed in shallow drawers, where the air can circulate around them. Some persons place them with the base of the bulb upwards; but the most material thing is to keep them from damp, and place them where there is a free circulation, as on a lattice shelf, or in open wicker baskets, with little sticks across to separate each layer of bulbs, and these baskets may be suspended to the ceiling, to keep them from vermin. If decay or canker

make their appearance, the parts injured, if small, should be cut out and the bulb laid aside to dry; but if the injury extends far, throw away the bulb at once, as the disease being infectious will communicate decay to the others.

It is one of those plants that thrive best in a saline atmosphere, and is therefore calculated to embellish the gardens on the sea coast: it loves a sandy soil, and a mixture of sea sand is in consequence recommended, whenever it can be procured. When planted in pots, it should be observed to select those of the deepest make, which should be filled with a sandy loam or earth, approaching as near to the compost recommended as possible.

The Hyacinth is considered the best flower for purposes of flourishing to great perfection in glass, and for this object Phillips strongly recommends those of a green color, as the white glass throws an injurious light on the roots. Nature tells us that the parts of plants which are destined for the earth cannot be kept too much in darkness, whereas the plant while growing, cannot receive too much light and sun, and should therefore be placed on a table near the window, unless in severe frosts, when it may be placed over the chimney, to prevent the water freezing, and never except to prevent it, as the heat is liable to draw the plants up, and thus make them too weakly to flower well. The beginning of November is early enough to place the bulbs in the glasses, which may be done from that time to the end of January, after which the bulbs, if kept out of the ground, shrivel and lose vigor, so that if it be desirable to have them later, the best plan is to keep a supply in the earth as a reserve. The glasses should be filled with soft water, with a small quantity of nitre in each, and not changed oftener than once a month; observing when plants begin to grow, to keep the glasses so that the bottom of the bulb may always touch the water. They will be strengthened by having as much free air as the season will admit of; but we should not forget that Hyacinthus prefers the beams of Phœbus to the breath of Zephyr; for if the latter be allowed to break or damage the foliage, the plant will be materially injured in its flowering; and, when in full flower, should not be placed where the sun throws his rays too powerfully

as this will considerably lessen the time of its duration. Should the flower stems appear weak, they may be supported by a slender prop, fixed in a disk of wood, on which the glasses may be placed as their base; or by any other elegant, or convenient means. The red and blue flowers are preferable for these purposes to white or yellow; the latter two having a fragrance too powerful for rooms, and besides generally flowering weaker than the others.

Deceptions are often practised by inserting Hyacinths in water, and pretending they grew in that position. Sinking the bulb entirely under water, after flowering, to invigorate it, adding salt to the water to give the leaves a deeper green, and keeping the water at a temperature of sixty degrees, should not be practised, though much recommended. This flower, in floral language, emblemizes Game, or Play, in allusion to its originating from the game of quoits. With the following beautiful lines from an Irish writer, we shall conclude, under the conviction that nothing more can be said in relation to the Hyacinth.

Oh ! mournful, graceful sapphire-colored flower,
Thou keep'st thine eye for ever fixed on earth !
Gentle and sad, a foe thou seem'st to mirth—
What secret sorrow makes thee thus to lower .

Perhaps 'tis that thy place thou can'st not change,
And thou art pining at thy prison'd lot ;
But oh ! where could'st thou find a sweeter spot,
Wert thou permitted earth's wide bounds to range ?

In pensive grove, meet temple for thy form,
Where, with her silvery music, doth intrude
The lucid stream, where nought unkind or rude
Dost break of harmony the hallowed charm.

Thy beauties all unseen by vulgar eyes,
Sol, in his brightness still delights to view ,
He clothes thy petals in his glorious hue,
To show how much of old he did thee prize.

And what the sighing zephyr hither brings,
To wander in these muse-beloved dells—
It is to linger midst thy drooping bells,
While vain repentance in thine ear he sings.

And sweetest flower. methinks thou hast forgiven
Him who unconsciously did cause thy death ;
For soon as thou hadst yielded up thy breath.
With grief for thee his frantic soul was riven.

And thou wert placed where mingled wave and breeze,
Their dreamy music with the vocal choir,
Whose varied harmonies might seem a lyre
Striving with dying notes thy soul to please,

Where winter ne'er ungraciously presumes
To touch thee with his sacrilegious hand—
Where thy meek handmaids are the dew so bland—
Where spring around thee spreads her choicest blooms.

'Tis not revenge, or pining wretchedness,
Thy head in pensive attitude that throws,
'Tis extreme sensibility that shows
In gestures, gratitude speech can't express.

E'en while I pay this tributary praise,
Methinks a deeper tinge thy cheek doth flush,
What, lovely one, need make thee thus to blush,
And turn away from my enraptured gaze.

No, gentle Hyacinth, thou canst not grieve,
When things so lovely worship in thy train;
The sun, the wind, the wave—Oh ! it were vain
To sum the homage which thou dost receive.

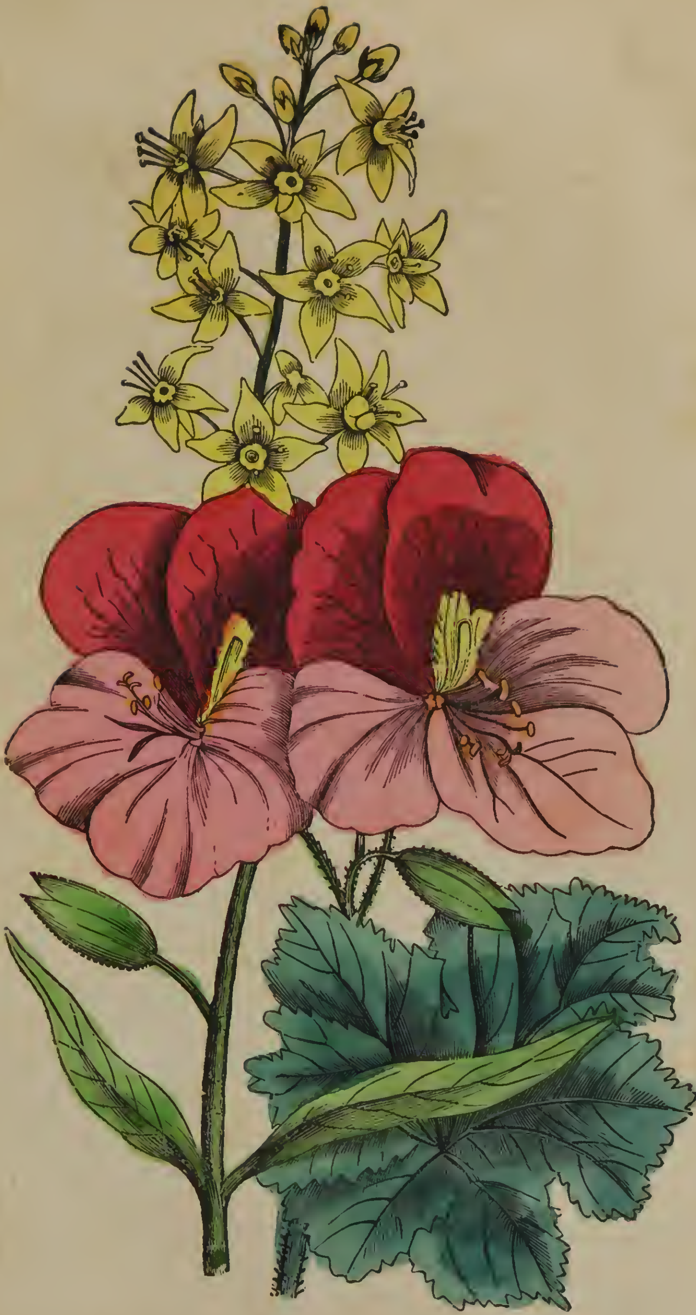
The sad and musing poetess you cheer—
At sight of thee, Mem'rys electric wings,
Waft to her soul, long, long-forgotten things—
Loved voices hushed in death, she seems to hear.

ANN.

The Wee Flower.

A bonnie wee flower grew green in the wuds,
Like a twinkling wee star amang the cluds ;
And the langer it leevit, the greener it grew,
For 'twas lulled by the winds, and fed by the dew,
Oh. fresh was the air where it reared its head,
Wi' the radiance and odours its young leaves shed.

When the morning sun rose frae his eastern ha',
This bonnie wee flower was the earliest of a'
To open its cups sealed up in the dew,
And spread out its leaves o' the yellow and blue.



GERANIUM AND LYSIMACHIA BULBIFERA.

When the winds were still, and the sun rode high,
And the clear mountain stream ran wimplin' by,
When the wee birds sang, and the wilderness bee
Was floating awa' like a clud ower the sea,
This bonnie wee flower was blooming unseen—
The sweet child of summer—in its rockely green.

And when the night clud grew dark on the plain,
When the stars were out, and the moon in the wane,
When the bird and the bee had gane to rest,
And the dews of the night the green earth pressed,
This bonnie wee flower lay smiling asleep,
Like a beautiful pearl in the dark green deep.

And when autumn came, and the summer had passed,
And the wan leaves were strewn on the swirling blast,
This bonnie wee flower grew naked and bare,
And its wee leaves shrank in the frozen air;
Wild darnel and nettle sprang rank from the ground,
But the rose and white lilies were drooping around;
And this bonnie blue flower hung doon its wee head,
And the bright morning sun flung his beams on its bed,
And the pale stars looked forth—but the wee flower was dead.

ANDERSON.

Saffron.

Crocus and Smilax may be turned to flowers,
And the Curetes spring from bounteous showers. OVID.

THERE are over one hundred kinds of named Crocuses, including hybrids and varieties, all of which come from about thirty distinct species. Fabulous history, observes Phillips, derives the name of this flower from a beautiful youth, named Crocus, who was consumed by the ardency of his love for Smilax; and afterwards metamorphosed into the plant, which still bears his name. Others suppose it to be taken from Coriscus, a city and mountain of Cilicia. It is one of the flowers of which Homer has composed the genial couch of Jove and Juno.

> And sudden Hyacinths the turf bestrow,
> And flow'ry Crocus made the mountain glow.
> Iliad, Book iv.

> Say, what impels, amidst surrounding snow
> Congeal'd, the Crocus' yellow bud to blow?
> Say, what retards, amidst the summer blaze,
> Th' autumnal bulb, till pale declining days?
> The God of seasons—whose pervading power
> Controls the sun, or sheds the fleecy shower;
> He bids each flower his quickening word obey,
> Or to each lingering bloom enjoins delay.
> White.

The Crocus is a genus of the class Triandria, order Monogynia; its characters are—Perianth funnel-form, the segments being united at the base into a lengthened, slender tube. Stigma three-cleft, convolute and crested. It is in the natural order Iridaceæ, or the Iris tube. So like, says Lindley, in speaking of the Crocus, is it to some of the Narcissus tribe, that a student would naturally suppose it to belong to it, especially when he found it had an inferior ovary (an ovary or germ below the calyx) with three cells, and its sepals and petals so much alike, as to be distinguishable only by one being rather differently colored, and placed on the outside of the other. It differs, however, in having only three stamens, instead of six, and in the anthers being turned with their faces towards the sepals, instead of towards the style; a singular peculiarity, which, in this case, is found to indicate a total absence of poisonous properties.

The Crocus Vernus—Spring Crocus, is distinguished by having the stigmas included within the flower, with three short wedge-shaped segments. It is, remarks Philips, one of the greatest enliveners of the flower garden in April, and when its bulbs are planted in sufficient quantities to give effect, their gaiety is scarcely surpassed by any plant on the parterre; but, like the Snow Drop, it is generally too sparingly planted, or placed in rows each side the walk, reminding us of street lamps by night. Like the Hepatica, the different varieties should be kept in distinct clumps, but not in beds, like a nurseryman's garden, whose primary object is to increase his plants.

In the borders of Flora, the hand of taste should be displayed,

but not in forming fanciful stars, or formal squares. Nature should be copied, who sprinkles her plants with that beautiful irregularity, which the happiest art cannot surpass. Much must depend in planting flowers, on the size and form of the garden; but it will always be found that one rich cluster of Crocuses, like a large brilliant, has a more imposing effect than a hundred small diamonds. They have all bulb-tubers, or corms, and should not be taken out of the ground oftener than every third or fourth year, which is an additional reason for planting them in large patches. They should be placed about two inches from each other; but where banks are to be covered with them should be scattered much thinner at the edges. From want of attention to the time and mode of the increase of bulbs, many plants are naturally lost by the ignorant gardener, who frequently cuts off the leaves of Crocuses, when past flowering, for the sake of neatness. This is a fatal error, as it weakens the power of perfecting the new bulb, and consequently of flowering the next year; for whilst the fibrous roots assist by suction the nourishment of the future plant, the leaves contribute to it, in no less degree, by their means of absorption and exhalation. The bulb is merely a body that protects the heart, or germ, from outward injury, whilst it receives and contains the necessary nourishment to form a new plant; and when it has filled its stores, the fibrous roots and the foliage have their communication stopped, and wither at the same time; and, until this has taken place, bulbs should never be removed. As the Crocus has a solid bulb, with its germ situated at the top, the new bulb always forms above the old one, so that in four or five years, they will have almost pushed themselves out of the ground, and this habit of growth occasions their being planted three or four inches deep. When it produces from three to five new bulbs, it becomes exhausted in the nourishment it affords its offspring and its flower, leaving no part of the original bulb, but a dry outer skin, or husk. When in flower, they are frequently destroyed by the smaller birds, which peck at them, and the bulbs are often eaten by mice. They ripen abundance of seed, but the seedlings do not flower till the third or fourth year. The soil, as we have before mentioned, in which the bulbs are

planted, should be of a light sandy loam; some only sink them two inches in this, and if the earth is of a cold or damp nature, do not cover them over an inch. Place them in the ground the last part of October, or early in November.

All the varieties of the Vernus, the most common of the species, are shaded with black, mixed with white; *C. Versicolor*, to which division belong the beautifully feathered kinds of the purple; *C. Biflorus*, the Scotch Crocus, striped white and purple, and generally the first to flower in spring; *C. Susiana*, the cloth of gold, striped orange and very dark purple; *C. Sulphurous*, very pale yellow or cream-colored; and *C. Luteus*, the common yellow. The yellow is the most showy for the garden, and the purple the most beautiful; the white, the least conspicuous, and the striped the most curious, particularly the blue striped, and the yellow striped with black. New varieties, with fanciful names, are annually exported from Holland.

"Ere a leaf is on a bush,
In the time before the thrush,
Has a thought about its nest,
Thou wilt come with half a call,
Spreading out thy glossy breast,
Like a careless prodigal,
Telling tales about the sun,
When we've little warmth or none."

It is common in many parts of Europe. In mild seasons, it blossoms in February; and its cheerful tints, when contrasted with the yet dreary aspect of nature, make it a welcome visiter It is a native of Italy and Spain. In Switzerland, it is found wild, with white petals, having a little purple at the base; and Gesner found it with a yellow flower, on the Glarus mountains. Both the purple and the white have been discovered as natives of Austria.

The Crocus appears to have been first cultivated in the English gardens during the reign of Queen Elizabeth, as Gerard observes, that that pleasant plant, that bringeth forth yellow flowers, was sent unto him from Robinus of Paris. Virgil speaks of it as a flower on which the bees delight to feed, and Milton gives it a place in Paradise.

Underfoot, the Violet,
Crocus and Hyacinth, with rich inlay,
Bordered the ground ; more colored than with stone
Of costliest emblem.

It seemed also to be considered by the ancients as an emblem of immortality, according to a passage of Juvenal, translated by Jeremy Taylor :—

"The heathens prayed for an easier grave, and a perpetual spring ; that Saffron would rise from their beds of grass."

Rocked by the chilly blast,
And mid the cold snow peeping,
Why do ye deck the waste,
When other buds are sleeping ?
Did ye, as they,
A while delay,
Till softer gales were sighing,
Perchance no flower,
In summer bower,
With ye in charms were vying.

No fervid beam, 'tis true,
Lady, our slumber breaketh,
From our light cups, the dew
No sportive zephyr shaketh ;
Heralds of spring,
The wind's rude wing.
We cope with at her calling,
And calmly eye,
Through darkly sky,
The snow flake thickly falling.

From lilies of the field,
Lady, thou art taught to borrow
Lessons which well may yield
Assurance for the morrow ;
And might we dare
Their task to share,
We'd say, May duty find thee,
Prompt at her call,
Whate'er befall,
To act the part assign'd thee.

The Crocus Sativus—Saffron Crocus, is distinguished from the other species of the genus, by its linear leaves, which are revolute at the margins, and a three-parted reflexed stigma, as long as the corolla. This flower is a native of Asia ; it is said to have been brought to England, in the reign of Edward III., and intro-

duced to Saffron Walden, in Essex, from which town it derives its common name. The leaves spring from the root; they have a long white furrow on the upper surface. The flower springs quite sessile from the bulb, with a long white tube, and purple or violet-colored elliptical segments. It is in the stigmas, the virtues, if any, reside; these are long, notched on the end, and project from the sheath, their deep orange color in beautiful contrast with the other parts of the flower. They are in flower in September. Some varieties have yellow perianths.

This autumn-flowering Crocus is cultivated on a large scale in some parts of England; the yellow stigmas, and part of the style, are taken out and dried on a kiln, between layers of paper, under the pressure of a thick board, to form the mass into cakes. There are large plantations also in France; but in that country, the bulb is frequently attacked by a fungus, which the French call *mort de Safron*, or Saffron killer, which makes it wither up and perish. The *Rhizoctonia* confines itself almost wholly to the roots of Lucerne and Saffron; the disease is manifested by the fading of the head of the plant. The contagion soon spreads around it, as rays from a centre. If one of the affected plants be pulled up, the roots will be found covered with the noxious filaments of this fungus, and the only way to prevent it spreading, is to bury the affected plants, in a sort of cemetery, for it is necessary to surround them by a ditch, in digging which, care must be taken to throw the earth inwards, to prevent its further progress. It emblemises, in floral language, the sentence, EXCESS IS DANGEROUS, from a slight infusion being agreeably stimulating; but, taken in greater quantities, producing madness.

Precepts of Flowers.

Flowers of the field, how meet ye seem
  Man's frailty to portray,
Blooming so fair in morning's beam,
  Passing at eve away;
Teach this, and, oh! though brief your reign,
Sweet flowers, ye shall not live in vain.

Go, form a monitory wreath
  For youth's unthinking brow,
Go, and to busy mankind breathe
  What most he fears to know;
Go, strew the path where age doth tread,
And tell him of the silent dead.

But whilst to thoughtless ones and gay,
  Ye breathe these truths severe,
To those who droop in pale decay,
  Have ye no words of cheer?
Oh yes! we weave a double spell,
And death and life betoken well.

Go, then, where wrapt in fear and gloom,
  Fond hearts and true are sighing,
And deck with emblematic bloom
  The pillow of the dying;
And softly speak, nor speak in vain,
Of the long sleep and broken chain;

And say, that He who from the dust
  Recalls the slumbering flower,
Will surely visit those who trust
  His mercy and His power;
Will mark where sleeps their peaceful clay,
And roll, ere long, the stone away.

Blackwood's Magazine.

Fly Trap.

The Dionœa Muscipula—Venus Fly Trap, is in the class Polyandria, order Monogynia. Natural order, Droseraceæ. Its generic appellation was one of the names of Venus, hence its common

term. The characters are—Calyx, five-leaved. Corolla, five-petalled. Stigma, fringed. Capsules, one-celled, opening irregularly. Seeds, many. Specific characters: Leaves radical, with terminating ciliate appendages resembling a trap; hence its name from the animals caught by it, *Muscipula*, Fly Trap.

Mr. Curtis, in a work on the plants of North Carolina, says, that the Fly Trap is found as far north as Newbern, and from the mouth of Cape Fear River to Fayetteville; and also quotes Elliot, who, on the authority of General Pinckney, mentions its growing along the lower branches of the Santee, in South Carolina, and also that it inhabits the savannahs, more or less, abundantly from the latter place to Newbern. It has been found in great plenty for miles around Newbern, in every direction. The leaf, he continues, which is the only remarkable part, springs from the root, spreading upon the ground, at a little elevation above it. It is composed of a petiole, or stem, with broad margins, like the leaf of the orange tree, from two to four inches long, which, at the end, suddenly expands into a thick and somewhat rigid leaf, the two sides of which are semi-circular, about two-thirds of an inch across, and fringed around their edges with rigid cilia, or long hairs, like eyelashes. The leaf may be very aptly compared to two upper eyelids, joined at their bases. Each portion is a little concave on the inner side, where are placed three delicate, hair-like organs, in such an order that an insect can hardly traverse it without interfering with one of them, when the two sides suddenly collapse, and enclose their prey with a force surpassing an insect's attempts to escape. The fringe, or hairs, of the opposite sides, interlace, like the fingers of the two hands clasped together. The sensitiveness resides only in those hair-like processes, on the inside, as the leaf may be touched or pressed in any other part without sensible effects. The little prisoner is not crushed and suddenly destroyed, as is generally supposed, for flies and spiders have been often liberated, which sped away as fast as fear or joy could hasten them. At other times they have been found enveloped in a fluid of mucilaginous consistence, which acted as a solvent, the insects being more or less consumed by it. This circumstance has suggested the possi-

bility of the insects being made subservient to the nourishment of the plant through an apparatus of absorbent vessels in the leaves. It is not to be supposed, however, that such food is necessary to the existence of the plant, though like compost, it may increase its growth and vigor. But however obscure and uncertain may be the final purpose of such an organization, if it were a problem to construct a plant with reference to entrapping insects, a form or organization to secure that end cannot be conceived better than that found in the Dionœa. It is, therefore, deemed no credulous inference, that its leaves are constructed for that specific object, whether insects subserve the purpose of nourishment to the plant or not. It is no objection to this view that they are subject to blind accident, and sometimes close upon straws as well as insects. It would be a curious vegetable indeed, that had a faculty of distinguishing bodies, and recoiled at the touch of one, while it quietly submitted to violence from another. Such capricious sensitiveness is not a property of the vegetable kingdom. The spider's net is spread to ensnare flies, yet it catches whatever falls upon it; and the ant lion is roused from his hiding-place by the fall of a pebble; so much are insects also subject to the blindness of accident.

Lindley observes, that by taking this plant from the nursery, and placing it among bog moss in a greenhouse, observing to keep it covered with a bell glass, and constantly damp, there will be secured one of the most curious examples of irritability the vegetable world contains, and which, in some respects, is more striking than even the sensitive plants, for they merely shrink away from the touch, while this firmly grasps with its wonderful leaves any thing that comes within their reach. Its leaves, he continues, spread in a circle round the crown of the root, and either lie flat upon the ground, or gently elevate themselves above the soil; they have no stipules or stipular fringes, but consist of two parts, very distinctly separated from each other, and very different in their nature; one of these parts is a stalk, and the other a blade, but both so much disguised, as hardly to be recognised. The stalk is a flat green wavy obovate, very obtuse leafy expansion, the veins in which are coarsely netted with curved branches, which grow-

ing to each others backs, form a number of somewhat lozenge-shaped meshes. The blade is joined to this by a very narrow neck, and consists of a roundish thick leathery plate, slightly notched at each end, having strong hidden parallel veins, which spread nearly at a right angle from the middle to the margin, and bordered with a row of strong, stiff, tooth-like hairs. When young, the two sides of the blade are placed face to face, and the teeth cross each other; afterwards, when full grown, the sides spread flat, or nearly so, and the teeth then form a firm spreading border. On each half of the blade stand three delicate, almost invisible bristles, uniformly arranged in a triangle. If one of these bristles is touched, the two sides collapse with considerable force, the marginal teeth crossing each other so as to enclose securely any small object which may have caused the irritation, or pressing firmly upon the finger, if that be the cause; but wonderful to relate, no other part of the leaf is sensible to external impressions. It is in vain that the back of the leaf is disturbed, or that the smooth glandular surface of the face is irritated; unless you jar one of the bristles, no irritability whatever is excited, and the leaf remains unmoveably open. The moment the shock is communicated through one of the bristles, the collapse of the leaf is effected, which then assumes altogether the appearance of an iron rabbit trap, when it has closed upon its prey. If at this time an attempt is made to open the leaf, it is violently resisted, in consequence of the rigidity of the side veins, whose contraction seems connected with the phenomenon. In the foregoing description, there is a little repetition; but, carrying out our intention to absorb the whole subject, we could not forbear giving the beautiful description of Lindley.

A single flower stalk, called in botanical language a scape, springs from the root, to the height of seven or eight inches, bearing on the top a cluster of flowers, supported on short footstalks of different lengths, which spring from a common centre. The calyx consists of five tooth-letted sepals: the corolla of five very blunt petals of a white color, slightly two-lobed at the point. The anthers are covered over with little glittering glands. The ovary has a depressed form, like that of an old German wine bottle: it contains but one cell, and gradually tapers into a green column

of a style, the point of which is split into a ring of fringes, and forms a stigma. The seed vessel is a small flash-shaped capsule, closely covered over by the calyx and remains of the corolla. It contains a considerable number of black oblong seeds, that are discharged only after the decay of the seed vessel, which has no means of spontaneously opening. And with mentioning the offices of the glands within the lobes, to secrete a sweet fluid, the sight and odor of which is to tempt flies, we will conclude our description. Nuttall tells us that, during the winter season, on exposing some separated leaves of this plant to the sun, at Wilmington, he observed them to make quivering attempts to close, for a long time, without being touched, as if they were possessed of a real sensibility; and, failing in the efforts, finally expired open.

Though this curious plant has been propagated by simple leaves in England, its natural method of increase is solely by seeds. It has a scaly root, almost like a liliaceous bulb, which sends out but few fibres. It is very difficult to keep, but does best in a greenhouse, grown in moss, with a little mould at the bottom of the pot, which must be kept standing in moss, and covered with a bell glass during the heat of the day. Mrs. Loudon remarks, that the glass is generally taken off towards evening, and the plant allowed plenty of fresh air, but some gardeners do not think this necessary. Some, about the end of February, re-pot the plant, taking it out of the old pot as it begins to grow fresh, perfectly cleaning from the old soil, leaving but a few roots, and then placing it in a new pot, which must sit in a saucer: keep constantly filled with water.

Nearly allied to Dionœa, and the type of its natural order, is the Sun Dew—Drosea Rotundifolia, the generic name of which is derived from a Greek word, meaning dew, on account of the shining little drops, on the glandular hairs of the leaves.—Hence also its common appellation, the characters are: calyx, permanent, composed of five sepals, united at base. Petals five. Stamens with anthers attached to each other. Styles, six or one deeply divided. Capsule round, one or three-celled, many seeded. It has five stamens, which places it in the Linnean class,

Pentandria; its styles place it in the sixth order of that class, Hexagynia. The specific name arises from its round-shaped leaves. Its characters are: scape simple. Leaves nearly round, narrowed at base. Petioles long and downy.

> Queen of the marsh, imperial Drosera treads
> Rush-fringed banks, and moss-embroidered beds;
> Redundant folds of glossy silk surround
> Her slender waist, and trail upon the ground.
> As with sweet grace, her snowy neck she bows,
> A zone of diamonds trembles round her brows;
> Bright shines the silver halo, as she turns,
> And as she steps, the living lustre burns.

It is thus, says Lindley, that Dr. Darwin introduces one of the most curious little plants in the world; and, although the exact rules of science will necessarily repudiate such language, yet it must be confessed, there is much poetical truth and beauty in the description. Any one, after this, would be anxious of an acquaintance with Drosera, who seems rather a fairy than a plant, by the poet's description; but there is little chance of beholding her upon her own moss-embroidered bed, unless by accident, for her home is in the fen and marsh, the oozy heath and treacherous morass, where she takes possession of every little hillock elevated somewhat above the surrounding waters, and from whence no art can induce her permanently to depart. If snatched from her native home and cherished with the most curious care, it is hardly possible to prolong her existence beyond a few short months. Let her, however, be sought by all means, for if the search is successful, it will amply repay the trouble. Then planted among some bog moss, in a saucer, or deep dish, with a bell glass over the whole, pour water into the dish till it rises above the rim of the glass, and keeping this supplied with liquid, will be performing all that art can effect to secure her. Mrs. Loudon speaks of the genus as British American, or Australian plants, with hairy leaves and curious flowers, which require to be grown in moss, or peat, or heath mould, kept moist, and during the heat of the day covered with a bell glass.

In this plant the most remarkable part are the leaves, and the least remarkable, the fructification. The former are nearly round,

and grow upon long hairy stalks; they are at first folded up in such a manner as to resemble little green hoods, but they afterwards spread out into small concave disks, covered with long shining red hairs, that secrete from their point a clear fluid, which gives the appearance of being covered with dew drops. Real dew, we are well aware, is always dispersed and dried up by the heat of the sun, so that it is only at the earliest hours of the morning that it can be seen in the summer; but the glittering dew-like secretion with which the leaves of this plant are bespangled, is most abundant when the sun is highest. The apparatus, by means of which the moisture is secreted, forms one of the most beautiful of objects for the microscope. By taking a single hair, and placing it under the microscope, taking care not to throw upon it from above, a strong reflected light, and using the precaution of cutting off all the rays that come from below, it will be seen that what seemed a little hair with a drop of water at its points, is really a long curved horn, transparent, and glittering like glass; delicately studded from top to bottom with sparkling points; beautifully stained with bright green, passing into pink, and mellowing into a pale yellow, as if emeralds, rubies and topazes, had been melted and just run together, without mixing; and finally, tipped with a large polished oval carbuncle, or ruby, of the deepest dye. In this there is no exaggeration; for what tints can possibly represent the brilliancy of vegetable colors, except those of the purest and noblest precious stones?

If this organ is observed a little more carefully, a number of faint streaks, running side by side, from its upper to its lower end, will be remarked, which are interrupted at brief and pretty regular intervals, by exceedingly short transverse lines. These marks are external indications of the cells that the organ is composed of, and it will be found that at least two thousand such are in each of these little horns. Every one of such cells is continually absorbing, secreting and digesting the fluids that pass into it from the leaf, or from the air, so that for the due performance of the office of such a minute body as a hair of the sun-dew leaf, no fewer than two thousand little digesting cells, or stomachs, are incessantly exercising and combining their trivial forces.

There is still the ruby-colored point to examine. In its interior structure it is like the hair itself, only all the parts are more solid; it is here that the fluid secreted by the hair is finally concentrated, and it is from this the dew is constantly exuding, so as to stand upon it like a drop of water. The hairs of many of the sun-dews possess the power of closing upon insects and holding them fast. The same description of their hairs is applicable to all others hairs, which are divided by botanists into *glandular*, in which the hair is either tipped with a secreting organ, as in the sun-dew, or arises from one, as in the Borage tribe, and the *lymphatic* in which it is wanting.

The flowers, when expanded, are elevated upon a slender scape, about five inches long, along one side of the upper end of which they are arranged, but when young, are coiled up in a gyrate manner. The calyx consists of five sepals, a little glandular externally, and nearly as long as the petals. The petals are five, snow white, blunt and spreading. There are five stamens growing from below the ovary, opposite the sepals. The ovary is a superior oblong case, of one cell, and bears three clusters of ovules on its sides; it is surmounted by three forked stigmas. The fruit is a capsule, half divided into three valves, and enclosing a multitude of minute seeds, each of which is invested in a loose membranous tunic, tapering to each end, and contains a kernel filled with a large quantity of albumen, in the base of which is a minute two-lobed embryo.

The Italian liqueur, called Rossoglia, is said to take its name from one of this species of sun-dew being used in its composition. This flower is the emblem of TEMPTATION.

Coffee.

THE COFFEA ARABICA—COFFEE is in the class Pentandria, order Monogynia. Some derive the generic name from the Hebrew, meaning a mixing together; so called from the pleasant potation

which is made from its berry. Others assert that the true name is Caffé, from Caffa, a province in South America, where, they say, the tree grows spontaneously in great abundance. It belongs to the natural order Rubiaceæ, or madder tribe.

The Coffee tree, in a favorable situation, attains a height of from fifteen to twenty feet; sometimes, we are told, thirty, and rarely forty feet. The branches are opposite, and so decrease in length, as they ascend, as to give the appearance of a pyramid, which is always covered with green foliage. The leaves are supported upon short footstalks, placed opposite each other; are of an oblong egg shape, ending in a taper point; entire, from three to five inches long, and of a smooth, shining dark green color, rather lighter on the under surface; each of them having at the base a pair of small-pointed leafy appendages, called stipules; in general appearance, they bear considerable resemblance to those of the bay tree.

The blossoms are of a white color, supported on short footstalks, which spring in little bundles from the angles formed by the leaf and stem, towards the upper part of the tree; so much, both in scent and shape, do they resemble the jasmine flowers, as to have formerly given the plant the name of Jasminum Arabicum. The calyx is small, just enough to give support to the tube of the corolla, which expands flatly, with a border divided into five long pointed segments. The stamens project above the tube, and there is but one style. The fruit is a berry, the size of a cherry; at first of green color, then red, which, in many instances, ultimately changes to a dark purple. Each berry encloses two hard oval seeds, about the size of a pea; one side of the seed is convex, while the other is flat, with a furrow through its largest dimension. While growing, the flat sides of these seeds are towards each other. A cartilaginous membrane immediately covers the seeds, which has received the name of parchment; and between which and the outside skin, is a yellowish pulpy matter. Our engraving represents a branch of the tree, with berries and flowers; *a*, represents the flower in detail; *b*, the parts of fructification; *c*, the entire berry; *d*, its interior; *e*, the kernel, with part of the rind taken off; *f*, *g*, *h*, parts of the kernel. In the West Indies, it is seldom

suffered to exceed four or five feet in height, for the sake of increasing its production.

The Coffee, remarks Lindley, the infusion of whose seed forms the beverage, which is probably the most universally grateful of all that the luxury of man has prepared, belongs to a very extensive natural order, almost confined to the warmer parts of the earth, comprehending the meanest weeds, and the most noble flowering trees; obscure herbs with blossoms, that it almost requires a microscope to detect, and bushes, whose scarlet corollas are many inches long, and producing drugs invaluable to man, for their important medicinal properties. If the Honeysuckles had well-defined stipules at the bases of the leaves, it would convert them into the Coffee tribe; for, notwithstanding many other differences in particular instances, the two natural orders, viewed in a general manner, can hardly be said to be distinguishable by any other characters. Coffee itself consists of the seeds of the plant, divested of their skin and the dark purple fleshy rind that envelope them. They are formed, almost entirely, of albumen, in the base of which a very small embryo is placed. A seed of any common Honeysuckle will show this; for, in all that regards the seed, the Coffee tribe and Honeysuckles agree. In North America, there grows a plant of the latter tribe, with broad leaves, clusters of flowers sitting close to the stem, and yellow berries, called Triosteum Perfoliatum, the seeds of which have proved the best of all substitutes for Coffee, and it is probable that all other plants of either tribes would answer the purpose equally well, provided their seeds were large enough, and their albumen of a hard horny texture.

At page 41, we spoke of its discovery by an Arabian shepherd, who having observed the goats of his flock, as often as they browsed upon the coffee fruit, to skip about and display other signs of intoxication, was led from this to try the effect of the berry upon himself, and thus found out its exhilarating qualities. It is a native of Southern Arabia and Abyssinia, probably pervading Africa, some think about the same extent of latitude, as it has been found growing wild in Liberia, on its western coast.

Botanists, remarks a writer, who furnishes us with most of

the remainder of this article, have enumerated several varieties of this tree, as existing in the Western and Eastern hemispheres. These varieties result from accidents of soil and climate; and must have been produced subsequently, by the naturalizing of this plant in America, since it is pretty generally shown that all the Coffee trees cultivated here are the progeny of one plant, which so recently as the year 1714, was presented by the magistrates of Amsterdam, to Louis XIV., king of France. This plant was placed at Maly, under the care of Jussieu; and it was not until some years after, that these plants were conveyed to Surinam, Cayenne and Martinico. In the island of Jamaica, it was introduced in 1728, by Sir Nicholas Lawes, who cultivated it on his own estate, called Temple Hall, in Liguana. It must have spread pretty rapidly, for in 1732 the production of Coffee, in that very island, was of sufficient consequence to call for an act of the legislature in its favor.

The use of Coffee as an alimentary infusion, was known in Arabia, where the plant, as we have remarked, is supposed to have been indigenous, long before the period first mentioned. All authorities agree in ascribing its introduction to Megalleddin, Mufti of Aden, in Arabia Felix, who had become acquainted with it in Persia, and had recourse to it medicinally when he returned to his own country; a story conflicting somewhat with the account of the shepherd. The progress which it made was by no means rapid at first, and it was not until the year 1554 that Coffee was publicly sold at Constantinople. Its use had in the meantime been checked by the authority of the Syrian government, on the ground of its alleged intoxicating properties; but, more probably, because of its leading to social and festive meetings, incompatible with the strictness of Mahommedan discipline. A similar persecution attended the use of Coffee, soon after its introduction into the capital of Turkey; when the Ministers of religion, having made it the subject of solemn complaint, that the mosques were deserted while the coffee-houses were crowded, these latter were shut by the order of the Mufti, who employed the police of the city to prevent any one from drinking Coffee. This prohibition it was

found impossible to establish, so that the government, with that instinctive faculty so natural to rulers, of converting to their own advantage the desires and prejudices of the people, laid a tax upon the sale of the beverage, which produced a considerable revenue. Since then its consumption there has been exceedingly great; and this fact may be in a great measure accounted for, by the strict prohibition which the Moslem religion lays against the use of wine and spirituous liquors. So necessary was Coffee at one time considered among the people, that the refusal to supply it in reasonable quantity to a wife, was reckoned among the legal causes for a divorce.

Much uncertainty prevails with respect to the first introduction of Coffee into use in the western parts of Europe. The Venetians, who traded much with the Levant, were probably the first to adopt its use, A letter, written in 1615, from Constantinople, by Peter de la Valle, acquaints his correspondent with the writer's intention of bringing home in Italy, some coffee, which he speaks of as an article unknown in his own country. Thirty years after, some gentlemen returning from Constantinople to Marseilles, brought with them a supply of this luxury, together with the vessels required for its preparation; but it was not until 1671 that the first house was opened in that city for the sale of the prepared beverage. In London, coffee-houses date their origin at a much earlier period. The first was opened in George Yard, Lombard-Street, by one Pasqua, a Greek, who was brought over in 1652, by a Turkey merchant, named Edwards. The first mention of coffee that occurs in the English statute books, is found in an act of the year 1660, whereby a duty of four-pence per gallon, to be paid by the makers, was imposed upon all coffee made and sold; three years after which, coffee-houses were directed to be licensed by the magistrates, at quarter sessions. The Dutch, in 1690, introduced it into Java, and in 1718 into their colony at Surinam; and after this it gradually spread over every part of the civilized world. Alphonso Wood, an eminent botanist of Massachusetts, remarks that in Paris and London, it seems not to have been in general use earlier than 1700 but since that time

enough has been drank in Europe and America to float the British navy.

Coffee cannot be cultivated to advantage in climates where the temperature at any time descends below 55 degrees of Fahrenheit's scale. The trees flourish most in new soils, on a gentle slope, where water will not lodge about the roots. In exposed situations, it is necessary to moderate the scorching heat of the sun, by planting rows of umbrageous trees, at certain intervals, throughout the fields. At Yemen, near Mocha, which place once had the monopoly of its trade, it is even now very extensively cultivated. The climate of Ceylon, in India, is also favorable to it, and some very fine coffee is raised in that place, but the better sort cannot be procured for home consumption. Speaking with the Rev. Levi Spaulding, the missionary there, who was in this country a few months since, he informed us that the residents were forced to put up with the poorer kinds, as the cultivators charged for it the price they hoped to get in London, where all they raise is sent; and, although when arrived there, it is uniformly sold at auction, at quite a low rate, the exorbitant demands of the growers are not lessened a whit at home.

It is usually raised from seed, in nursery grounds, which germinate in about one month, and grow so rapidly during the next eleven, as to fit the trees for transplanting; which is done, by placing them at regular distances, varying according to the nature of the soil. When this is very dry, or gravelly, the trees seldom rise higher than six feet, and may be planted five feet apart; but in rich soils, where they attain the height of nine or ten feet or more, intervals of ten feet, should be left between them. As a general rule, it is better to make their distance apart, the same length as their height.

It is well known that the Coffee imported from the West Indies does not equal in flavor that produced in Arabia, and other parts of the east; and it is commonly imagined that this inferiority is owing to local causes, and therefore incapable of being remedied. There is reason for believing, however, that the superior quality of Turkey and East India Coffee is not, in any degree, to be referred to the influences of soil and climate, but depends at least, in part,

upon the age to which the seeds are kept, before they are brought into consumption. It will be well also to remember in this connection, that Tea cannot be used, until upwards of a year after it is picked. Trees planted on a light soil, and in dry elevated spots, produce smaller berries, which have a better flavor than those grown in rich, flat and moist soils; the weight of the produce yielded by the latter, however, is double that obtained from the former; and, as the difference in price between the two is by no means adequate to cover this deficiency of weight, the interest of the planter naturally leads him to the production of the largest but least excellent kind. It is consequently asserted, that the difference of quality, entirely disappears by keeping, and that the worst Coffee produced in America will, in a course of years, not exceeding ten or fourteen, be as good, parch and mix as well, and have as high flavor as the best now obtained from Turkey. The *Mocha* Coffee, known by its small and roundish grains, ranks first; but little of this is now imported from the east. The Java comes next. Our principal supplies are, of course, derived from the West Indies and South America. A good article is raised in Liberia.

The trees begin bearing, when two years old, and the third year yield their full supply; and continue productive from twenty to thirty years. Two harvests are afforded in each year. The aspect of a Coffee plantation when flowering, which does not last longer than one or two days, is very interesting. In one night the blossoms expand themselves so profusely, as to present the same appearance as would be witnessed by a casual snow storm, loading the trees while still furnished with their autumnal complement of foliage. The seeds are known to be ripe when the berries assume a dark red color, and if not then gathered, will drop from the trees. The planters in Arabia do not pluck the fruit, but place cloths for its reception beneath the trees they shake, and the ripened berries drop readily. These are afterwards spread upon mats, and exposed to the sun's rays, until perfectly dry, when the husk is broken with large heavy rollers, made either of wood or stone. The Coffee thus cleared of its husk, is again dried thoroughly in the sun, that it may not be liable to heat when packed for shipping.

The method employed in the West Indies differs from this. Negroes are set to gather such of the berries as are ripe, and for this purpose are provided each with a canvass bag, having an iron ring or hoop at its mouth, to keep it always distended, and this bag is slung round the neck, so as to leave both hands at liberty. As often as this bag is filled, the contents are transferred to a large basket, placed conveniently for this purpose. When the trees are in full bearing, an industrious man will pick three bushels a day. If more are gathered, proper care can hardly be exercised in selecting only the berries that are ripe. It is the usual calculation, that each bushel of ripe berries will yield ten pounds weight of merchantable Coffee.

In curing Coffee, it is sometimes usual to expose the berries to the sun's rays, in layers five or six inches deep, on a platform. By this means, the pulp ferments in a few days, and having thus thrown off a strong acidulous moisture, dries gradually during about three weeks, the husks being afterwards separated from the seeds in a mill. Other planters remove the pulp from the seeds as soon as the berries are gathered. The pulping mill used for this purpose, consists of a horizontal fluted roller, turned by a crank, and acting against a moveable breast-board, so placed as to prevent the passage of the whole berries between itself and the roller. The pulp is then separated from the seeds, by washing them, and the latter are spread out in the sun to dry. It is then necessary to remove the membranous skin or parchment, which is effected by means of heavy rollers, running in a trough, wherein the seeds are put. The mill is worked by cattle. The seeds are alternately winnowed, to separate them from the chaff, and if any among them appear to have escaped the action of the roller, they are again passed through the mill. The roasting of Coffee for use is a process that requires some nicety; if burned, much of the fine aromatic flavor is lost, and a disagreeable bitter taste substituted. The roasting, is now universally performed in a cylindrical vessel, which is continually turned upon its axis, over the fire place, in order to prevent the too great heating of any one part, and to accomplish the continual shifting of the contents. It should never be kept for any great length of time after it has been

roasted, and never ground until the moment of its infusion, or some portion of its fine flavor will be dissipated. Accustomed to the compounds of burnt rye and beans, generally mixed with a poor article of Coffee, which is sold in our cities, the editor was little prepared, whilst in South America, for the delicious flavor of the first cup of Coffee he drank there. They never keep the powder on hand, but roast and grind just before making the infusion. Humboldt, many years ago, estimated the quantity of Coffee annually consumed in Europe, at a hundred and twenty million pounds.

With us this is a stove shrub, which a florist directs should be grown in loam and peat, in pots well drained, and sufficiently large to allow of room for its roots. The flowers appear in August or September. If kept well watered, it will flower every year, and the seeds ripen. It requires a dry heat when in the growing state, and only a moderate degree of warmth in winter. When kept in a moist store, without free circulation of air, the leaves become mildewed and infested with insects. The fragrant and beautiful flowers, which produce such valuable fruit, make this plant the emblem, in floral language, of TRUE FRIENDSHIP.

Yew.

Beneath those rugged Elms, that Yew-tree's shade,
Where heaves the turf in many a mouldering heap,
Each in his narrow bed for ever laid,
The rude forefathers of the hamlet sleep. GRAY.

The YEW—TAXUS BACCATA, is in the class Deœcia, order Monadelphia; the generic name is derived from the Greek, meaning an arrow, because that weapon was formerly poisoned with the juice of this tree; its characters are; Staminate flowers—Calyx having four or six scales, piled on each other. Stamens eight to ten. Anthers peltate, with from six to eight cells, that discharge their pollen from beneath. Pistillate, or fertile flowers—Style none.

Receptacle, cup-form and juicy. Nut fleshy, open at the extremity, and one-seeded. Specific characters: Leaves thickly set, linear, two-ranked and flat; flowers, axillary and sessile. Receptacles of the staminate flowers, globose. It belongs to the natural order Coniferæ.

This tree, remarks a writer, is of no little celebrity, both in the military and the superstitious history of England. It is common to Europe, America, and the Japanese Isles. Mr. Gilpin considers it a pure native of Britain, and formerly very abundant, being then to that country what the oak is now, the basis of its strength. Cæsar mentions it as having been abundant in Gaul; and much is now found in Ireland, imbedded in the earth. The trunk and branches grow very straight, the bark is cast annually; and the wood is compact, most impenetrably hard, and beautifully rich in both color and veins; but it is noted not so much for beauty as its other and more important qualities of toughness and elasticity, which last properties have rendered it in the manufacture of weapons of warfare, most famous in history. It is of great use in every branch of the arts, in which firm and durable timber is required; and before the general use of fire-arms, was in high request for bows; so much was it wanted for the latter purpose, that ships trading to Venice were required to bring ten bow staves along with every butt of Malmsey. The leaves are slender and needle-shaped. The berries, about the size of a small nut, are formed of the most delicate wax-like materials; they are red and cup-shaped, containing a transparent glairy fluid, like the white of an egg. Their taste is sweetish and inoffensive, and they are considered harmless.

The tribe to which this tree belongs is peculiarly a northern order; for the few species which are found between the tropics, shunning the scorching plains, are always seen cresting the loftiest heights, to which they form the most fitting ornament. When left to its own choice, it grows most freely in mountainous woods, or more particularly in the fissures of limestone rocks. It has been often remarked, that the needle-shaped leaf, peculiar with few exceptions to evergreens such as this that grow in Northern climates,

or Alpine heights, fit them for braving the difficulties to which their situation exposes them, as it allows the snow and wind free passage through the interstices, securing them alike from an overpowering accumulation of the one, and from the resistless fury of the other. It is also chiefly owing to this peculiar form of the leaves not admitting the reflection of much light, that trees of this description wear such a dark lugubrious appearance, and that furthermore, by presenting so many points and edges, the wind makes amongst them that wintry music, so powerfully affecting to the imaginative wanderer, soothing or rousing him according to the part it sustains in the grand chorus of nature. Burns, with all a poet's feeling, speaks of the enjoyment he experienced from this wild minstrelsy. Whilst listening to its varied cadences on a cloudy winter day, he tells us that it is then his best season for devotion, his mind being wrapped up in a kind of enthusiasm to Him, who in, the pompous language of the Hebrew bard, walks on the wings of the wind.

For upwards of an hundred years after gunpowder was invented, the Yew-tree bows continued in use as the favorite English weapon; to it, indeed, they owed, as history tells us, their most famous victories. In the reign of the fourth Edward, a law was enacted that every man throughout his dominions should have a bow of his own height, made, if possible, out of this tree; for, says Roger Ascham, after mentioning many other trees, experience doth prove them to be meant for bows; and so to conclude, Ewe, of all other things, is that whereof perfect shooting should have a bow made. Shakespeare agrees with him, when he says—

> The very beadsmen learn to bend their bows
> Of double-fated Yew against the state.

Yew-trees often attain an enormous size, and some wonderful specimens are pointed out by English writers. The trunk of a large Yew, found by Pennant in the church-yard of Fortingal, in Perthshire, though wasted to the outside shell, and with only a few leaves at one point, is quoted by him as being fifty-six feet in circumference, or about eighteen feet in diameter. One at Mu-

cruss Abbey, in Ireland, has a trunk about six feet and a half in circumference, and fourteen feet high, which terminates in a head that fills the area of the cloisters. In England and Wales, some very large specimens are mentioned. According to Evelyn, the Crowhurst Yew was thirty feet in circumference; that at Braburne church-yard, in Kent, was nearly twenty feet diameter, although it had been dismantled by storms. Considering the immense size to which the Yew grows, and the strength, durability, and even beauty of its timber, a writer regrets that when these great trees have yielded to the power of time, there should be no succession of them, but little attention being paid to their cultivation, on account of their extremely slow growth. The improvement in iron manufacture, and the great cheapness of that useful metal, supplies a substitute for many purposes, to which the great strength and pliability of the Yew was well adapted.

The custom of clipping Yews into fantastic shapes, was much practised in the sixteenth and seventeenth centuries, and many church-yards in the old countries still have their Yew trees cut into the pretended likenesses of birds and beasts. At Bedford, in England, are two celebrated trees, whose branches are annually shaped into something like the form of a peacock, with a date showing when this piece of useless labor was first performed. The Romans also cut their evergreens into the same fantastic shapes. How well do I remember, says a lady, my grandfather's Yew tree wonders, which consisted of a hedge one hundred yards long, six feet thick, and about the same in height, which was smoothly shorn, and so solid that I have seen lions, bears, dogs and horses standing on the top of it, as if it were solid earth. No one could be more astonished than myself, on the first evening I beheld the sight. It was towards the dusk in autumn. The place was quite strange to me, as it was my first visit; my aunt, who then herself a girl, took me into the garden and showed me these forms, distinctly enough seen in the moonlight to alarm me. She foollishly tried to make a regular fright of the appearances which these shapes presented, and assured me they were indeed strange and awful creatures. What they stood there for, she could not exactly

tell, but added "I think to-night, that they will have something to do with *you*, (yew)." I entreated her to take me in; but she insisted on leading me nearer, that we might see if they began to move, and listen if they breathed hard, which was a sure sign they would be stirring soon. The next morning explained all; these were Yew trees, cut as was then the fashion, into the shape of animals. They would, of course, only move when the wind shook them; and the wind whistling through them would make a noise similar to breathing. Shenstone playfully condemns this tampering with the graces of nature. Art, said he, is indeed often requisite to collect and epitomise the beauties of nature, but should never be suffered to set her mark upon them. Why fantastically endeavor to humanize those vegetables of which nature, discreet nature, thought it proper to make trees? Why endow the vegetable bird with wings, which nature has made momently depending on the soil for subsistence. Lord Bacon, with his wonted good sense, protested against the practice, which was the fashion of his time. I, for my part, says he, do not like images cut out in juniper, and other garden stuff; they be for children.

A writer, in giving Sorrow as the emblem of the tree, remarks, that there is in every plant something which either attracts or repels us. All nations to this tree, assign the same emblem. The twigs and leaves are poisonous, have frequently proved fatal to cattle, and sometimes to the human species. Plants are said to die under its shade, and if the weary traveller should sleep under its umbrageous branches, his head becomes affected, and he soon feels violently ill. It also exhausts the earth that yields it nourishment. The ancients, guided by a natural sentiment, thought it a fit resident in the cemetery, and so destined it to overshade the tomb. The Greeks, who had true conceptions of the beautiful in nature, were affected like ourselves by the sorrowful aspect of this tree, and imagined that the unfortunate Smilax, when rejected by young Crocus, was changed into the Yew. In Europe, it was formerly considered a large tree, one or more being in every church-yard, and they were held sacred. In funeral processions, the branches were carried over the dead by mourners, and thrown

under the coffin in the grave. In the ancient laws of Wales, we find an account of a far higher valuation of this tree than that of the reputed sacred mistletoe of the Druids. Shakespeare makes it one of the deadly ingredients of the witche's cauldron.

The Irish Yew, from its crest form and broad leaves, makes a very handsome plant, which, from the slowness of its growth, we considered a long time as a shrub. There are some Japan and China species of this order, which are very ornamental. They are all raised from the seeds, and will grow in any common garden soil.

Few weeks have sped, since from yonder pile
  A merry chime was rung,
And blossoms meet for a fair young bride,
  On the church-yard path were flung.

But that chime is changed to a doleful knell,
  And those flowers so gay and fair,
To funeral wreathes—for the youthful bride
  Now lies shrouded on her bier

And by white-robed maids is she borne along
  To her grave, beneath the shade
Of the lonely Yew ; and oh ! loud is their wail,
  As the last sad rites are paid.

Spell-bound, I stood by that sentinel tree,
  And I could not choose but weep,
As one by one, that sorrowing train
  Left the dead to her lonely sleep.

And as I mused on the fearful sights
  That hoary Yew had seen,
'Twas fancy, I know, but me thought a voice
  Thus sounded the gusts between :

" Yes, mortal, yes—I have that to tell
  Would turn beauty's bright cheek pale,
Would cause the sallies of mirth to cease,
  And e'en warrior's heart to quail.

I have seen the old, like a shock of corn,
  Safe garner'd in the tomb ;
I have seen the babe, of a few brief days,
  Cut off in its early bloom.

I have heard o'er the grave of her only son,
  The widow her wailings pour ;
Then I've seen her turn to her desolate home,
  Now reft both of fence and flower.

Mortal! thou know'st not how passing short
Thy number'd days may be,
Oh, then, so live that, when comes the last,
Death may have no sting for thee!

Introduction to Botany.

The Agaricus Pratensis—Champignon, as its specific name denotes, is found growing naturally in meadow lands. Like the common Mushroom, it has a solid stem, with the cup of a pale yellow brown at the upper surface, and the gills yellowish. It grows on more moist land than the common Mushroom, and therefore is in itself to be looked upon with more suspicion. There is, however, another circumstance which renders the eating of this Mushroom unsafe, that on the upper surface it very much resembles the most poisonous of all the toad-stools, *Agaricus Virosus*, and their both growing in similar situations. The gills of the poisonous fungus are, however, broader in proportion to the size of the plant than in the Champignon, and they are very dark-colored, or black. The fleshy part of the cup is also thinner, and there is a collar upon the stem of the poisonous one, while the Champignon is naked. Many of the different species of this genus are, however, so similar to each other, some being wholesome, while others are highly noxious, that persons who are not perfectly familiar with their respective characteristics, should hesitate before they venture to gather the Mushroom for consumption. The smell, whenever nauseous, should be a certain ground of rejection; but even a good flavor is not always a safe criterion. The Champignon has but little smell, and is rather dry, yet when broiled and stewed, communicates a good flavor. The Agaricus Muscarius is the largest and most beautiful of all the agaric tribe. It has a large cup, nearly flat, of a brilliant pink or crimson color, sometimes beset with angular warts, and is extremely conspicuous, even at a distance, in the shaded recesses of its native woods.

In other countries, many species of the fungi are not only considered edible, but are likewise made the objects of cultivation. A species of Boletus is raised by the Italians, for which purpose two kinds of stones are used. The one of a calcareous formation, containing vegetable fibre, and found in the chalk hills near Naples; the other an indurated turf from the volcanic mountains near Florence. Both of these have the quality of imbibing moisture, and if either of them be kept in a cellar, and constantly watered, it will produce this fungus; but the water with which they are moistened, must occasionally be that in which the Boletus has been washed, and in which, of course, its seeds are contained. The Agaricus Ostreatus, another edible species, is obtained from the husks of the berries of the Sweet Bay—Laurus Nobilus; after the oil has been extracted by boiling, the husks are burned in a trench, and are then submitted to considerable pressure, and covered with a layer of earth, half-a-foot thick, and the whole protected from excessive rain; and after a suitable time, a large crop will spring up. At Geneva, they are produced in a similar manner, by using the refuse of the olive oil presses. In the landes of the south of France, the earth under oak trees is sometimes kept continually moist by water in which the edible Boletus has been boiled, whence, it is said, arises an abundant crop of that species, which, we are told, resembles the cocoa-nut in taste. It is one of the Boleti that supplies the spink, or touchwood; all the species are distinguished by the under side of the cup being pierced by numerous pores, in place of the gills of Mushrooms. The derivation of the word Boletus is generally considered to be from either of two Greek words, one meaning a mass, and the other in allusion to its globular form.

The Morel—Phallus Esculentus, is described as a spheroid, hollow within, and covered externally with a net-work of irregular sinuses. It is of a yellowish color, standing on a smooth white stalk, the whole rising to the height of about four inches. The substance, when recent, is wax-like and friable. It is used as an ingredient to certain highly-seasoned dishes; and when gathered dry, will keep for many months. It is a native of Britain, growing

in damp woods and moist pastures, and coming to perfection in May or June. Gleditsch mentions, that in some woods in Germany, this fungus had been found in the greatest perfection in those parts where charcoal had been made. Acting upon this hint, the Morel gatherers were accustomed to make fires in the thicket, but these were sometimes attended with such serious consequences, that legal interference became necessary to forbid the practice. It is not, in any case that we know, made an object of culture, though Lightfoot says he has raised it from seed.

The TRUFFLE—TUBER CIBARIUM, is found growing in clusters some inches under the surface of the ground, in a soil which is composed of clay and sand. It is nearly spherical, and without any visible root; of a dark color, approaching to black, and studded over with pyramidal tubercles. The internal part is firm and grained with serpentine lines; its color is white when young, but grows darker with age. Naturalists, who have examined its structure with microscopic attention, affirm that minute oval capsules, each containing from three to four seeds, are embedded in its substance. Truffles are natives of the woods, both of Scotland and England, and found also in the United States, but they are not produced in such abundance, nor do they attain equal perfection with those which grow in some parts of the continent, and especially in Italy. In the latter place, they are found weighing sixteen pounds. Since there is no appearance to indicate the particular spot where the Truffles lie concealed, man calls the sagacious dog to assist him in his search after these subterranean delicacies. With much pains, this animal has been taught to discover them by the scent; if successful, he barks and scratches up the ground—when the gatherer follows, and digs up the object of his pursuit. They are used in a similar manner to the Morel and Mushroom; and are considered the best of the fungi, but confined in their locality, and not artificially cultivated.

Nuttall, speaking of the subterranean tuber of our southern states, mentions the considerable esteem in which it is held as an article of food, and describes it as being the size of the human head, exactly the form of a cocoa-nut, and covered by a woody,

scaly, hard, brown bark; internally filled with a somewhat fleshy, cork-like matter; when in perfection, approaching a flesh-color. It is scarcely acted upon by any re-agent, and remains unaltered for months in water, having no fermentable substance. Nothing, Nuttall beautifully concludes, really organic, can be of a more simple structure than the subjects of this genus, and particularly the present gigantic species. Yet, still these almost amorphous masses are subject to life and death, experience growth, and give origin, as parents, to a renewed progeny. No real affinity, then, subsists, even here, with the mineral or inanimate kingdom, whose respective particles have no limited tie of existence, and remain unalterable and inert, being subject only to the laws of chemical relation. The Lycoperdon—Puff Ball is the last of the fungi on our plate; when fresh, it is of a white color, with a very short, if any stalk, growing in higher pasture grounds. When young, it is sometimes covered with tubercles on the outside, and is pulpy within. By age it becomes smooth externally, and the inside dries into a very fine light brownish dust; at this time the slightest touch will cause it to explode, and send its dust into the air, as seen in our engraving.

In the economy of nature, remarks a writer, the fungi are the attendants upon decomposition. Their seeds are too minute for the eye, or even for the microscope, and therefore may be present everywhere, undetected in the vessels, the fluids, and probably the solids of plants and animals. The instant vitality ceases in these, the seeds of the fungi come into action. Accordingly they are most abundant during the autumn, in rank and shady places; and, in rainy weather, when decayed plants and insects may be presumed most to abound. The fungi themselves, when they decay, are, as well as extraneous substances, subject in their turn to the attacks of other fungi. The rapidity with which the germs develope themselves, is quite as wonderful as the length of time, and the number of dangers through which they continue their dormant existence. To spring up like a mushroom, in a night, is a scripture phrase, which accords wonderfully with observation. Sowerby tells us, he has often placed specimens by a window one

night while in the egg form, and they have been fully grown by the morning; but they never grew in the day-time with him. From these, and other analagous experiments, it is not too wild a speculation to suppose, that if placed in the requisite circumstances as regards temperature, moisture, and absence of light, the whole earth would be speedily overrun with fungi.

These substances sometimes grow in a singular manner, a remarkable instance of which is furnished by what is called the fairy rings in Britain, which rings are formed perfectly regular when the surface is uniform, but vanishing when they come to gravel or marsh. On these rings an innumerable array of fungi spring up in the latter end of summer. When they are in progress, the grass withers, and the ring has the appearance of having been trodden by invisible feet; hence its name. The distinction is, however, only temporary, for by the time the rest of the grass is withered, that on the fairy path becomes green and vigorous, and a new circle is formed next season, immediately on the outside. When two rings meet, they do not cross each other, but unite, and gradually become an oval; but if a circle be interrupted by any small obstacle, such as a tree or stones, it will unite again on the other side. These rings are formed by various species of mushrooms, and also puff balls; but the cause of the circular formation has not been satisfactorily explained. It would seem that the decayed matter of the fungi is not immediately fit for the production of another crop, and thus the annual sowing is outwards. It also appears that the remains of the fungi is favorable to the grass by which it is succeeded.

Medical Department.

The Hyacinth, in this department, is dismissed with the mere mention of its name.

Saffron: It is said that five pounds of the fresh stigmas will

yield one pound of the dried Saffron. The best article is that which is dried loosely, though it is sometimes pressed into cakes. We are told that a Saffron field will cease yielding the fourth year. The English article 's by far the best, as the Spanish has considerable oil added to it, with a view, we are told, to its better keeping. That imported from Gibraltar is packed in canisters. The various ports of the Mediterranean yield occasional supplies. It is frequently adulterated with the flowers of other plants, particularly those of the common Marygold and Safflower. It may be known from them by putting some of the mass into hot water, which will cause expansion, and thus expose the deception. A close examination is always necessary before using, as the fibres of dried beef, Crocus stamens and mineral substances are much used by the dealers. If bought in cakes, select that which is close, firm and tough in tearing. Good Saffron is not easily powdered. Thrown on the coals, it diffuses a pleasant smell; and rubbed between the fingers, imparts its yellow dye to them. It should always be kept in glass vessels, with glass mouths, the top covered by a piece of bladder, to prevent the escape of its volatile ingredients.

It has a sweetish aromatic odor, and a warm, bitter taste, and chewed, will color the saliva to its own rich orange hue. When analyzed, the greater portion is found to consist of extractive matter—a volatile oil, with the peculiar flavor of the Saffron, wax, gum, albumen and some salts, besides water and vegetable fibre. Vogel named the extractive matter POLYCHROITE, or many-colored, from the tint changing very often during its preparation. It is prepared by making a strong tea of the Saffron, boiling this down to the consistence of honey, dissolving the soft mass in alcohol, which is then filtered and evaporated to dryness. It is of a reddish yellow color, and somewhat deliquescent, of a bitter taste and agreeable smell, soluble with difficulty in water, to which the yellow color is imparted, and dissolves readily in oils and alcohol. Nitric acid, poured on it, turns it a grass-green color, and sulphuric

to a blue and violet. Henry thinks the coloring constitutes 42 per cent. of Saffron, and the essential oil 10 per cent.; this last may be separated, in a measure, by distillation.

Saffron was formerly renowned for its highly stimulating and anti-spasmodic qualities. We were told that in small doses it produced exhilaration, relieved pain, and finally ended its effects by inducing sleep; in larger doses, head-ache, intoxication, delirium and madness, were the results—Schrœder even asserting that two or three drams would be inevitably fatal. It was also employed to act on the uterine system, and, when the menstrual flow did not occur at the proper time, to bring it on; and for all these various qualities was much esteemed until the time of Dr. Alexander, who instituted a long and able course of experiments for the purpose of ascertaining its virtues. After a considerable time spent in the examination, he came to the conclusion that it possessed but little activity, and, as a medicine, was comparatively worthless. The medical profession of Great Britain and America, satisfied of the truth of his results, ceased to prescribe it, so that, were it not for the ridiculous idea entertained of its power of throwing the poison to the surface in eruptive diseases, and its consequent employment by the common people, it would long since have been buried in oblivion. As it is, there is a considerable demand for it, and it is often employed by the profession to impart color and flavor to other medicines. If exhibited, from ten to thirty grains may be given without danger for a dose.

Syrup of Saffron.—Take of Saffron three drams, boiling water a pint, sugar, refined, three pounds; put the water and Saffron together in a covered vessel, twelve hours, or during the night; then strain the liquor, and placing it over the fire in a proper vessel, gradually add the sugar till all is dissolved; keep in a glass-stoppered bottle. This is slightly stimulant. A teaspoonful is a dose.

Tincture of Saffron.—Take of Saffron cut in shreds an ounce; of alcohol and water, mixed equally, fifteen ounces

by weight; pour the diluted alcohol on the Saffron; let it remain for seven days, and then filter, remembering to keep every thing tightly stopped up. This possesses all the properties of Saffron. The dose is from twenty to forty drops.

Coffee grains should be quite hard, and so heavy as to readily sink in water. The odor and taste change considerably after roasting, during which process it doubles in size and loses one-fifth of its weight, acquiring at the same time a bitter taste. Roasting develops the volatile oil, and a small proportion of tannin. Besides these two principles, it contains a fixed oil, gum, extractive matter, resin, woody fibre, salts, and a peculiar crystallizable principle called caffein. Pelletier obtained this substance by bruising two ounces of the coffee seeds, pouring a pint of alcohol on them, letting it remain a week, and boiling down; he then submitted this to the action of a pint of water some days, after which he threw an ounce of magnesia on the solution, and filtered, evaporating afterwards to the consistence of a syrup. The syrup was dissolved in alcohol, filtered, again evaporated, giving by cooling a number of flexible, silky and opaque needles; but if allowed to evaporate, the crystals are in long, transparent prisms. It has a bitter and disagreeable taste, and is easily melted. In roasting, this substance seems unchanged, as it can be obtained from either preparation.

We are told that the infusion or decoction of the roasted seeds of the berry, if not too strong, is a wholesome, exhilarating and strengthening beverage; and when mixed with a large proportion of milk, is a proper article of diet for literary and sedentary people, and more especially suited to persons advanced in years. People who are bilious, and liable to costiveness, should abstain from it. When drunk very strong, it proves stimulating and heating in a considerable degree, creating thirst and producing watchfulness. By an abusive indulgence in this drink, the organs of digestion are impaired, the appetite is destroyed, nutrition is impeded, and emaciation, general debility, paralytic affections and nervous fever are

brought on. Hooper remarks that this is by far the most salutary of all the liquids drunk at meal-time, as after hearty eating it will relieve the sense of oppression so apt to be experienced, enabling the stomach to digest with much more ease. From the great degree of wakefulness it induces, it is capable of resisting, in a measure, the effects of both alcohol and opium, and is consequently a useful remedy when too much of either is taken.

Dr. Grindel, of Russia, used the unroasted berry in intermittent fevers with considerable success, but with less effect than the Peruvian bark. He gave it in powder, in the dose of a scruple every hour; or in the state of extract, in from four to eight grains.

Sir John Pringle, in cases of obstinate spasmodic asthmas, usually ordered an ounce for a dose, newly burnt, and taken without sugar or milk; the dose repeated, if relief was not procured in fifteen minutes. It is recommended for exciting the functions of the brain, when they are torpid from deficient energy. The Egyptians formerly employed it as a remedy in suppression of the menses, with good success. Hayne informs us that in a case of violent spasmodic disease, attended with short breath, palpitation of the heart, and an exceedingly frequent pulse, immediate relief was afforded, after all the spasmodics had been tried for hours. Dr. Chapman, of Philadelphia, found it highly useful in Calculus Nephritis. The medicinal infusion is made by pouring a pint of boiling water on an ounce of coffee, of which a cupfull warm each time is a dose.

The Agaricus Muscarius—Bug Agaric—is used by the inhabitants of the north-eastern part of Asia in the same manner as ardent spirits or wine, to promote intoxication. It is the favorite drug, *mucho-more*, of the Russians, Kamschatdales and Korians, who all use it for this purpose. These fungi are collected in the hottest month, and hung up by a string in the air to dry; some dry of themselves on the ground, and are said to be far more narcotic than those artificially preserved.

Small deep-colored specimens, thickly covered with warts, are also said to be more powerful than those which attain to a larger size and are of a paler color. The usual mode of taking this fungus, is to roll it up into a little ball and swallow it without chewing, as the Kamschatdales say masticating it would disorder the stomach. It is sometimes eaten fresh, in soups and sauces, and then loses much of its intoxicating property. When steeped in the juice of the berries of the *Vaccinium Uligmosum*—our Mountain Whortleberry—its effectare the same as those of strong wine. One large or two small fungi is a common dose, to produce a pleasant intoxication for a whole day, particularly if water be drunk after it, which intensifies the narcotic principle. The desired effect comes on one or two hours after it is taken. Giddiness and drunkenness result in the same manner as from wine or spirits. Cheerful emotions of the mind are first produced—involuntary words and actions follow, and sometimes an entire loss of consciousness. It renders some persons remarkably active, and proves highly stimulant to muscular exertion; with too large a dose, violent spasmodic effects are produced. So very exciting to the nervous system in some individuals is it, that the effects are often ludicrous in the extreme. If a person under its influence wishes to step over a straw or small stick, he takes a stride or a jump sufficient to clear the trunk of a tree; a talkative person cannot keep secrets or silence, and one fond of music is perpetually singing.

The Puffball is used by the common people to stop the bleeding which succeeds wounds, and this is about its only employment in medicine.

Biographical Department.

WILLIAM BALDWIN.

This gentleman, who ranks among the pioneers of American Botany, was born in Newlin township, Chester county, Pennsylvania, on the 29th of March, 1779. His father, a respectable minister in the Society of Friends, was in very moderate circumstances, and the son received, in consequence, a rather limited education. After spending some time as pupil, he turned teacher, in which employment he remained until he entered the office of Dr. Todd, in Downingtown, a place in the same county, to study medicine. Known from early youth for an enthusiastic and persevering pursuit of knowledge—more especially of the sciences—it was therefore the best profession he could have selected; and the event fully justified his choice. When about twenty-four years old, he attended his first course of lectures in the University of Pennsylvania. At their conclusion, he returned to his preceptor, with whom he practised as assistant for nearly two years. About this time, he became acquainted with the nephew of Humphrey Marshall, the well-known botanist, and founder of the Botanic Garden at Marshalltown. Dr. Moses Marshall, himself a respectable naturalist, took considerable pains to bias young Baldwin's mind in favor of Botany, and gave him access to the splendid collection of plants in the garden founded by his uncle; and from this time forward, his love of the vegetable kingdom increased.

His straitened circumstances not permitting another attendance at the University, he occupied himself in the theory and practice of medicine. In 1805 he received the appointment of Surgeon to a merchant ship which was to sail from Philadelphia to China; and so little forethought had he concerning his new position, as actually to embark with only three shirts in his wardrobe. On his return, in 1806, he again

entered the University, where he graduated in April, 1807. He then settled in Wilmington, Delaware, where he married Miss Hannah M. Webster, of that place. Hereditarily predisposed to consumption, the approaches of the destroyer forced him to go south in 1811. War soon after broke out, and he entered the Navy as Surgeon. In 1817 he was appointed by government as Surgeon of the Constitution, which was to visit the South American ports—his principal office being to investigate the vegetable productions of the places which they might touch at during the voyage. He returned in 1819, just in time to accompany Major Long's expedition up the Missouri, as Surgeon and Botanist. His strength gave way on the journey, and his gentle spirit left this world of care on the first day of September following, in his forty-first year. He was a kind and skilful physician, and a devoted student of nature; and his name will not be forgotten while a lover of his favorite science remains in our country.

Primrose.

Mild offspring of a dark and sullen sire
Whose modest form, so delicately fine,
Was nursed in whirling storms
And cradled in the wind;

Thee, when young Spring first questioned Winter's sway,
And dared the sturdy blusterer to the fight,
Thee on this bank he threw,
To mark his victory.

In this low vale, the promise of the year,
Serene thou openest to the nipping gale,
Unnoticed and alone,
Thy tender elegance.

So virtue blooms, brought forth amid the storms
Of chill adversity; in some lone walk
Of life she rears her head,
Obscure and unobserved;

> While every bleaching breeze that on her blows,
> Chastens her spotless purity of breast,
> And hardens her to bear,
> Serene, the ills of life. KIRKE WHITE.

The PRIMULA VULGARIS—PRIMROSE—is in the class Pentandria, order Monogynia. The generic name is derived from the Latin *primus*, first, prime, or early; and hence primerose, contracted into primrose: and although in fact this flower is preceded by some others, yet on the least encouragement from the sun and wind, it blossoms very early, seeming anxious to appear among the first that tell us tales about the spring. Its characters are—Corolla salver form, with an open orifice, five-lobed. Capsule one-celled, the pollen thrown out from a ten-cleft orifice. Stamens not exserted. Stigma globular. The specific name comes from another Latin word, meaning common. Its characters are—Leaves obovate, toothed, rugose, villous beneath. Umbel radical. Flower stalks as long as the leaves. Corolla flat. This genus is the type of the natural order Primulaceæ, or Primrose tribe. Lindley, in speaking of this tribe, remarks, that endeared as they are all to us, by some of the sweetest recollections of infancy, it would almost amount to a crime to pass them by with neglect. They have all regular single-petalled flowers, with fine stamens and a superior seed-vessel, and are distinguished by one circumstance, by which they may with certainty at all times be distinguished among the wild flowers, that of their stamens being opposite the lobes of the corolla—a curious and permanent distinction. Interesting as are many of the species of this natural order which we can observe, they are far inferior in beauty to their relations who live on the mountains of other countries; for the tribe most frequently prefers Alpine stations to all others. It is in the higher regions of the mountains of Switzerland and Germany, on the Pyrennees, and upon those stupendous ridges from which the traveller beholds the vast plains of India stretching at his feet in a boundless panorama, that the Primrose tribe acquires its greatest beauty. Living unharmed beneath a bed of snow during the cold

weather, where it is protected alike from light and from drying winds, as soon as the snow is melted it springs forth, bedecked with the gayest tints imaginable. Yellow, and white, and purple, violet and sky-blue are the usual colors of its flowers; while its leaves, nursed by the food descending from a thousand rills of the purest water, and expanded beneath an ever genial and cloudless sky, acquire a green which no gem can excel in depth or brightness. And it is in those regions only that the Primrose tribe can be studied to the greatest advantage.

The Primrose is an evergreen herbaceous plant, perennial in its duration, and with us sending forth its beautiful blossoms in April and May. Aimé Marten says that the saffron tufts of this delicately-perfumed and modestly-colored early blossom are emblematical of EARLY YOUTH; being emblematical of the period between childhood and womanhood. It announces the return of Spring, when we see the snowy mantle of retiring Winter ornamented with embroidery of verdure and of flowers. The season of hoar frost has passed, but the bright days of summer have not yet arrived. The timid Laura has scarce attained her fifteenth year, and would fain join the romping games of her younger companions, but is unable to do so. She watches them, and her heart burns to follow them. But a distaste for childish joys, which she cannot vanquish, disturbs the heart of the young beauty. An interesting paleness is spread over her face, her heart languishes, and she sighs, scarce knowing why. She has been told, that as spring succeeds to winter, the pleasures of love follow those of infancy. Poor girl! you will soon learn that those pleasures are mingled with bitterness and tears—

> "For the wild bliss of nature needs alloy,
> And care and sorrow fan the fire of joy."

The arrival of the Primrose tells thy entrance to womanhood; but it also tells that the happy period of infancy can never return.

Shakespeare considers this the emblem, when he speaks of

> —— Pale Primroses,
> That die unmarried, ere they can behold
> Bright Phœbus in his strength.

Phillips humorously remarks, that in tracing back the nativity of flowers, we are greatly assisted by the mythological writings of the ancients; for without these records, we should have pronounced them all as being the children of Nature; and the relationship which this favorite flower bears to the gods, would have remained unknown, as well as the history of its origin. It was anciently called Paralisos, after the name of a beautiful youth, who was the son of Priapus and Flora, and who died of grief for the loss of his beloved Melicerta, but was preserved to his parents, by being metamorphosed into this flower, which has since divided the favors of the poets with the Violet and the Rose. Clare says:—

> Oh who can speak his joys, when Spring's young morn
> From wood and pasture opened to his view;
> When tender green buds blush upon the thorn,
> And the first Primrose dips its leaves in dew.
>
> And while he plucked the Primrose in its pride,
> He pondered o'er its bloom 'tween joy and pain;
> And a rude sonnet to its praise he tried,
> Where nature's simple way the aid of art supplied.
>
> Robbed each Primrose-root I met,
> And oftimes got the root to set;
> And joyful home each nosegay bore,
> And felt—as I shall feel no more.

The Primrose is a native of most parts of Europe; always seeking the partial shade of hedge-rows, the banks of sheltered lanes, and the borders of woods or coppices, and is but seldom found spangling the open meadows, like its relative, the Cowslip. From this we should learn to place it on the banks of our wilderness walks, and to scatter it thickly beneath the trees of the shrubbery. It will grow in almost any soil, but thrives best in a clayey bank. When trans-

planted in the spring, it receives a check to its flowering, which often causes it to blossom freely in the autumn. When it does this, it has been compared to a lady matured in years, whose beauty has been marred by the ravages of time, decking herself in the gay habiliments of youth. Such a one has been thus reproved by Housman :—

> The solitary Primrose hath come back
> To haunt the green nooks of her happy spring.
> Alas! it is a melancholy thing,
> Thus to return, and vainly strive to track
> The playmates of our youth! Whither have fled
> The sweet companions of her vernal hours?
> The bee, the infant leaves, the golden flowers,
> That heard the cuckoo's music, as he sped
> O'er hill and dale—whither have they departed?
> And the blithe birds—have they, too, passed away?
> All, save the darkling wren, whose plaintive lay
> Just tells the hermitess is broken-hearted.
> Go, then, pale flower, and hide thy drooping head,
> For all thy spring-time friends are changed, or dead.

The variety of the common Primrose with double flowers of a lilac color, forms a most agreeable contrast with the pale Primrose of the woods. All the species of this genus, the Polyanthus, Primrose, Oxlip and Cowslip, fecundate one another readily, so that an endless number of varieties may be raised from the seed. These may be gathered when the capsules are ready to burst, the latter part of July, and sown immediately in a shady border, or in pots or pans of loamy soil, kept moist and shaded. The covering should be very slight, otherwise the seeds will not come up. In fine seasons, seeds sown as soon as they are gathered, will produce plants which will flower the following autumn ; but in general they need not be expected to blossom until the next spring. When the seedlings have produced two or three leaves, they should be transplanted into rich loamy soil, in a shady situation, at the distance of a few inches from each other ; and as they come into flower, the good sorts should be marked, and the less admired kinds pulled up and thrown away. When the seed is not sown immediately after being gathered, it may be

kept till the following April, and treated as above mentioned.

Flowers of pale, but lovely bloom,
Given to grace my humble room,
On my spirit's wakened sense
Pour thy silent eloquence.

Tales it tells of days gone by,
When, in spring, my boyish eye,
On the bank, or in the grove,
Gazed on thee with joy and love.

Fairer flowers, which gardens bear—
Proud exotics, reared with care—
Beautiful though they may be,
Never can compare with thee.

Thou art rich from memory's store,
With the wealth of life's young lore;
Lore by books but poorly taught,
Wealth by riches never bought. BARTON.

There may be here and there one perhaps in this every-day world, insensible to the witchery of such reminiscences, and to whom the poet's descriptive lines may be applied without a libel:—

A Primrose by a river's brim,
A yellow Primrose was to him—
And it was nothing more.

From the paleness of its hue, and its growing in groves and shady situations, it is generally, in poetry, invested with a mournful character, such as Milton has given it, when he says, "Bring the rathe Primrose, that forsaken dies." Might I differ, remarks the authoress of the following lines, from such high authorities, its retiring beauty, and its love of dingle and bushy dell, would rather lead me to consider it as a fit emblem of modesty and humility.

Fairest of all that's fair
In Nature's works are ye, ye wilding flowers,
When thus at Spring's first beck, ye brightly rear
Your shining heads, to herald her bright hours.

But that your bloom is brief,
And here and there on some slight stem a thorn,
Half hid, perchance, beneath a shrivell'd leaf,
Tells unto what sad destiny ye're born;

I could have thought the doom,
Which gave to ruin earth, to storms the sky,
And Man, God's last, best work, into the tomb,
Your primal beauty had unharmed passed by.

But are ye loved the less,
That for our sakes these earth-born traits ye wear?
Oh, no! the very blight which mars your grace,
And speaks your frailty, makes ye but more dear.

Nor this your only claim
On Man's regards: meekly from glade and bower,
Ye warn and counsel him, as 'twere your aim
To win him back to Paradise once more.

Yes, each of ye in turn
Points some pure moral to the human heart:
One, bending 'neath the storm, to those who mourn,
Lessons of meek endurance may impart;

Others, that breathe at eve
Sweet incense, urge to watchfulness and prayer;
And with united voice all bid us leave
The morrow to our common Father's care.

And thou, so fair and pale,
Thou lovest 'mid grass and shadowing leaves to hide
Thy modest charms; sweet Primrose, thee I hail,
Reprover meek of vanity and pride.

Alas! that pride, which wrought
Man's wo in Paradise, should haunt him still,
No hated inmate, but with every thought
Twined, closely twined, and prompting aye to ill.

Oh! when within my breast
Such thoughts are stirring, do thou gently chide,
And timely whisper from thy leafy nest,
"Shall Man be proud, to sin and death allied?"

Aloe.

The Aloæ Perfoliata—Common Aloe—is in the class Hexandria, order Monogynia. The generic name is derived from the Hebrew, and signifies, growing near the sea. The characters are—Corolla erect, with an expanded mouth; bottom nectariferous. Filaments inserted into the receptacle. Specific characters—Stem leaves toothed, embracing, sheathing. It belongs to the natural order Liliaceæ, or the Lily tribe.

All the species of this genus, as far as we know, will yield a bitter juice, which has all the properties for which Aloes is medicinally used. It is a difficult thing to tell exactly the species from which we derive our supplies, but it is probable all are used occasionally to furnish it; and we have figured the one described by Linneus, as a sample of the whole.

Our specimen has a round smooth stem, generally rising to the height of fifty inches, with a diameter of four inches; it is of a shining green color, surmounted at the top by a leafy appendage, considered bracteal scales by some. The leaves, in common with those of other plants under a burning sun, are thick and juicy, about two feet long, very broad at the base, narrowing gradually to a point, grooved on their upper surface, and beset with acute teeth, and very numerous. The flowers are thimble-shaped, of a bright scarlet color, and whole assemblages of them spring horizontally from the sides of a common stem; a mode of inflorescence called a spike. With us they are in bloom from May until September. The flowers are succeeded by a three-celled capsule, containing numerous seeds.

It is a native of Southern Africa, and was introduced from the Cape of Good Hope to England in 1731, and has been grown in our conservatories in the United States for a long time. Large tracts of land are covered with it in its native

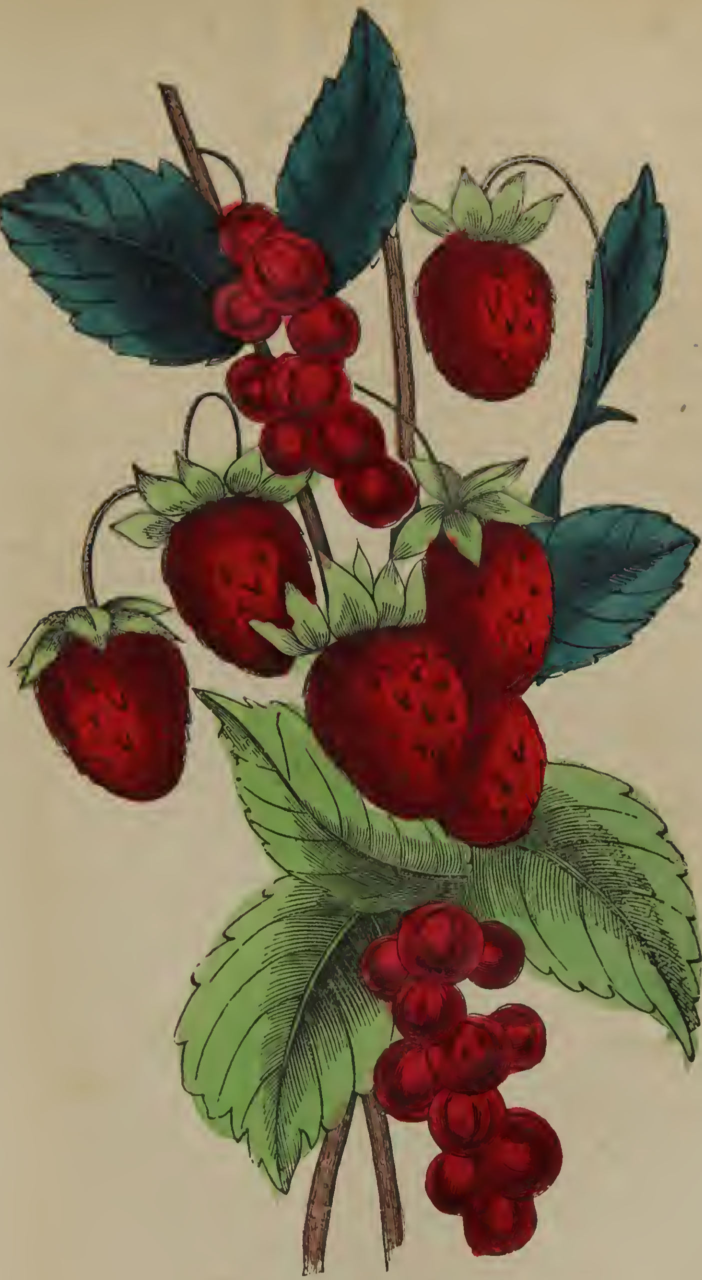
place, where it is said to thrive best in the desert, and is only attached to the soil by a very slender fibre. Growing spontaneously in such immense quantities, cultivation is unnecessary, and the only trouble taken with it is when, at the age of two or three years, the most succulent leaves are cut off near the root, and placed perpendicularly by the side of each other in tubs. The juice is then evaporated in the sun, till it becomes of a proper consistence. Thunberg tells us, that the leaves are often cut in small pieces, and then set aside for the juice to exude, and that by either of these two methods, the best Aloes is procured. A much inferior kind is obtained by boiling the leaves in water, and evaporating in iron cauldrons to the requisite thickness. It is then poured in casks, which contain from one to three hundred pounds.

Aimé Marten, in making the Aloe emblemize BITTERNESS, remarks, after speaking of its arid habitation, that so sorrow drives us away from the world, detaches our hearts from the earth, and fills them with bitterness. This plant derives its subsistence principally from the air and moisture, and assumes very singular and fantastic shapes. Le Vaillant found many species very numerous in the deserts of Namaquoise; some of them six feet long, which were thick, and armed with long spines. From the centre of these, a light twig shoots forth to the height of a tall tree, all garnished with flowers. Others exalt themselves like the Cactus, bristling with thorns. Others again are marbled, and seem like serpents creeping upon the earth. Brydone saw the ancient city of Syracuse entirely covered by great Aloes in flower; their elegant branches giving to the promontory which bounded the coast, the appearance of an enchanted forest. The collection of these plants in the museum at Paris, is said to be the most complete of any in the world.

The Aloes grow best in greenhouses or rooms, the pots being well drained, and the soil composed of a sandy loam, mixed with a little lime-rubbish or gravel. To this, when the plants are wanted to attain a large size, may be added a

little leaf mould. When grown in rooms, the poor soil is preferable, as it keeps the plants of a smaller and more manageable size, and makes them less easily affected by changes of the temperature, and heat and dryness. The colors of the flowers will also be richer, when grown in poorer soil. All the kinds should be frequently watered when they are in the growing state and about to flower; but the water that runs through the mould in the pot, should always be poured directly out of the saucer; as, if water be allowed to remain in a stagnant state about the roots, the leaves will rot and drop off. It is to prevent water lodging round the crown of the plant, which would produce the same effect, that gravel or lime-rubbish should always be mixed with the soil. When the plants have done flowering, water should be given to them very sparingly, not oftener than once a month, and they should be kept in a dry, warm situation, where they will have plenty of light. It is generally propagated by offsets or suckers; but in some instances may be increased by stripping off a leaf, letting it dry a day or two, and afterwards planting it quite shallow in a pot of sandy soil, giving a very little water. In the course of a few months, one or several buds will be found formed at the base of the leaf, and roots being thrown down from the same point, a new plant will be produced. Several of the species will grow without earth or any other substance about their roots, by being merely suspended in the house, and now and then sprinkled with water.

Needs no show of mountain hoary,
  Winding shore, or deepening glen,
Where the landscape in its glory
  Teaches truth to wondering men:
Give true hearts but earth and sky,
And some flowers to bloom and die;
Homely scenes and simple views,
Lowly thoughts may best infuse.



STRAWBERRIES AND CURRANTS

Flowers.

Buttercups and daisies—
  Oh, the pretty flowers—
Coming ere the spring-time,
  To tell of sunny hours.
While the trees are leafless,
  While the skies are bare,
Buttercups and Daisies
  Spring up here and there.

Ere the Snowdrop peepeth,
  Ere the Crocus bold—
Ere the early Primrose
  Opes its paly gold—
Somewhere on a sunny bank
  Buttercups are bright;
Somewhere 'mong the frozen grass
  Peeps the Daisy white.

Like the hardy flowers,
  Like the children poor,
Playing in their sturdy health
  By their mother's door;
Purple with the north wind,
  Yet alert and bold;
Fearing not and caring not,
  Though they be a-cold.

What to them is wealth?
  What are stormy showers?
Buttercups and Daisies
  Are these human flowers.
He who gave them hardship,
  And a life of care,
Gave them likewise hardy strength
  And patient hearts to bear.

Welcome, yellow Buttercups,
  Welcome, Daisies white;
Ye are in my spirit
  Visioned a delight—
Coming in the spring-time,
  Of sunny hours to tell,
Speaking to our hearts of Him
  Who doeth *all things well.*

Mary Howitt.

Sugar-Cane.

Sugar must be considered as one of the most valuable vegetable substances with which civilized man has become acquainted. So varied and extensive are its uses, and so greatly does it minister to the social gratifications of mankind, that we are justified in ranking it as inferior only in the vegetable economy to the cereal grains.

After giving the Tea and Coffee plants, we will now follow up the series by one with which they are so closely connected as to be all three inseparable companions. Sugar, chemically speaking, is included in, or forms a constituent part of, a very numerous range of plants, being either contained ready formed, or capable of being developed, in all that will yield alcohol after fermentation and distillation.

In the first rank among those plants which furnish sugar stands the Saccharum Officinarum—Sugar-Cane—which is in the class Triandria, order Digynia. The generic name is derived from the Arabian appellation of the plants. The characters are—Calyx two-valved, involucred, with long down. Corolla two-valved. Specific characters—Flowers panicled in pairs, one without and one with a footstalk. Corol awnless. It belongs to the natural order Gramineæ, or the grass tribe.

The Sugar-Cane is an herbaceous plant, with a jointed, juicy root, from which arise a number of stems. These are smooth and shining, from an inch to an inch and a half diameter, and ten feet long, containing a white and juicy pith. The joints are about three inches asunder, forming partitions the whole length of the plant, denoted by the outside rings; and it is from these rings the leaves shoot. The leaves, as they spring from the stalk, embrace it at their base; they are about an inch wide, three or four feet long, flat, taper-pointed, smooth, and finely-toothed on the edges; they are furnished with a white midrib—have long lines running

along their whole length, and are of a green color, inclining to yellow. The flowers are whitish, surrounded by a long, silky down, and disposed in large, pyramidal clusters, some two or three feet in length. The plant has a general resemblance to Indian Corn. We have given two varieties, the East Indian and the West Indian, which last was introduced to that place from Otaheite, by Bligh.

The Sugar-Cane must be considered as a native of China, since it has been pretty accurately shown that its cultivation was prosecuted in that Empire some two thousand years before Sugar was even known in Europe, and for a very long period before other Eastern nations became acquainted with its use. For some time after this substance, in its crystalline form, had found its way to the westward, through India and Arabia, a singular degree of ignorance prevailed in regard to its nature, and the mode of its production; and there is reason for believing that the Chinese, who have always evinced an unconquerable repugnance to foreign intercourse, purposely threw a veil of mystery over the subject. Persons have not been wanting, even in modern times, who have approved of this anti-social spirit, as being the perfection of political wisdom; but is it not a complete answer to the opinion, that every nation which has cultivated commercial relations, has been steadily advancing in civilization, and adding most importantly to the sum of its comforts and conveniences, while the inhabitants of China, although possessed of the greatest natural advantages, arising from the variety of soil and climate, and whereby they had so long placed themselves in advance of other people, have remained altogether stationary? The case of this extraordinary people forms altogether, and in many ways, a standing enigma in the history of our species, the solving of which could not fail to prove highly instructive and interesting.

A knowledge of the origin of Cane-Sugar was correctly revealed in the middle of the thirteenth century, by the celebrated traveller Marco Polo, though it was partially known

much earlier. The plant was soon conveyed to Arabia, Nubia, Egypt and Ethiopia, where it became extensively cultivated. Early in the fifteenth century it first appeared in Europe. Sicily took the lead in its cultivation; thence it passed to Spain, Madeira and the Canary Islands; and shortly after the discovery of the New World by Columbus, this plant was conveyed to Hayti and Brazil, from which places it soon spread through the West Indies.

The Canes have knotty stalks, and at each joint a leaf is produced. The number of joints varies in different specimens—some having as many as eighty, and others not half that number. The new varieties conveyed from Bourbon, Java and Otaheite, are so superior to the old plant, that its cultivation has ceased. They are much larger in diameter, have a much greater distance between the stalks, and come sooner to maturity, than the old Brazil Cane. This occupies, from the time of its being planted until it is fit for cutting, a period of from twelve to twenty months; while the larger varieties by which it has been superseded are fully ripe in ten months. It varies exceedingly in its growth, depending upon the nature of the soil. In new and moist land, it sometimes attains the height of twenty feet; while in ground that is arid and calcareous, its length does not exceed from six to ten feet. It is always propagated from cuttings. In our climate, the seeds have not been known to vegetate; and although there must, doubtless, be some country where the course of nature could be followed in this respect, we are not acquainted with any place in which the cultivators resort to the sowing of seed in order to the propagation of the plant. The top joints are always taken for planting, because they are less rich in saccharine juice than the lower parts of the Cane, while their power of vegetating is equally strong. It is possessed of the power of tillering in a manner similar to that shown by wheat, although not to an equal extent. In preparing a field for planting with the cuttings of Cane, the ground is marked out in rows three or four feet apart, and in

these lines holes are dug from eight to twelve inches deep, and with an interval of two feet between the holes. Where the ground is level, large spaces are left at certain intervals, for the facility of carting; but there are many situations, at the sides of steep hills, where no cart can be taken, and in such cases these spaces are not required. The ripe Canes are then conveyed to the mill in bundles, on the backs of mules, or are passed down to the bottom of the hill through wooden spouts. The hoeing of a Cane-field is a most laborious operation, when performed, as it must be, under the rays of a tropical sun. Formerly this task was always effected by hand-labor, but of late years, where the nature of the ground will admit of the employment of a plow, that instrument has been substituted, to the mutual advantage of the planter and his laborers. The planting of Canes does not require to be renewed annually. In such a case, the utmost number of laborers now employed on a Sugar plantation would be wholly inadequate to its performance. The most general plan is, for a certain portion of the land in cultivation to be planted annually, and in succession, the roots and stoles of the Canes of the former year being left through the remaining parts of the plantation. From these, fresh Canes, which are called rattoons, spring up, and are nearly as large the first year as plant Canes. Rattoon Canes have a tendency to deteriorate, at least in size, every year they are continued; for which reason the progressive renewal of the plants is adopted. This plan may, however, be continued for several years, with very good effect, provided the roots are furnished every year with a liberal supply of manure, that the ground about them is well loosened, and that all weeds are carefully removed. In this way, it is said, the same roots have been made to send up Canes during twenty years. In some few cases, the planters adopt a different course, and never wholly renew any individual field of Canes, but content themselves with supplying new cuttings in such particular spots as from time to time appear to them too thin. The mode of cultiva-

tion varies, in some particulars, in different countries. In India, where the price paid for labor is exceedingly small, great pains are taken in preparing the ground for the reception of the plants, which are carefully weeded and watered and freed from insects, at all periods of their growth, when such operations are called for. Unfortunately for the Indian Sugar cultivator, something more than mere labor is required for the proper manufacture of his produce—an acquaintance with chemical science, and the possession of adequate apparatus—in both which particulars he is lamentably deficient. The Indian agriculturist would suffer death rather than be guilty of the crime of innovation. The discoveries of scientific men are to him as though they had never been made; and in conducting processes, he is contented with apparatus, the total cost of which does not exceed many shillings, where manufacturers of other countries would think it necessary to expend thousands of dollars. Some think that if these inveterate prejudices could be overcome, the Indian Sugar planters would monopolize this branch of trade. It would with us, however, make very little difference if their processes were improved, as our Southern States furnish three-fourths of the Sugar we use, and probably will soon furnish the whole, more especially since the annexation of Texas; in which place a resident mentions, that, like most other crops, it has there heretofore received but very little attention, and very few and small fields have been cultivated. Enough, however, has been done to prove that all the level parts of Texas, and, most probably, the level prairies of the Western rivers, are capable of producing it in abundance and high perfection. Where it has been planted along the Brazos, it has grown with a luxuriance and to a size unknown among the river bottoms of Louisiana. It is asserted, also, that a greater length of stalk matures its saccharine juice, and that this juice is richer than that found on the Mississippi. The comparative superiority of Texan Sugar-Cane over that of the other Southern States, is declared by so many witnesses,

and those of such high respectability, as to remove all doubt of its truth.

When the Canes are fully ripe, they are cut close to the stole, and being divided into convenient lengths, are tied up in bundles and conveyed to the mill. This always consists of three iron cylinders, sometimes standing perpendicularly in a line with each other, and at other times placed horizontally, and disposed in the form of a triangle, and so adjusted that the Canes, on being passed twice between the cylinders of either kind of mill, shall have all their juice expressed. This is collected in a cistern, and must be immediately placed under process by heat, to prevent its becoming acid, an effect which has sometimes commenced as early as twenty minutes from the time of its being expressed. A certain quantity of lime water, or of lime in powder, is added at this time, to promote the separation of the feculent matters contained in the juice; and these being as far as possible removed at a heat just sufficient to cause the impurities to collect together on the surface, the Cane liquor is then subjected to a very rapid boiling, in order to evaporate the watery particles, and bring the syrup to such a consistency, that it will granulate on cooling. The quantity of Sugar obtainable from a given measure of the Cane juice varies according to the season, the soil, the period of the year and the quality of the Canes; but it may be calculated, that taking one state of circumstances with another in these respects, every five gallons imperial measure of Cane juice will yield six pounds of crystallized sugar, and will be obtained from about one hundred and ten well-grown Canes.

The fuel used for thus concentrating the juice, is furnished by the Cane itself; which, after the expressing of the juice, is dried for the purpose, by exposure to the sun. When sufficiently cooled in shallow trays, the Sugar is put into hogsheads, for shipment. These casks have the bottoms pierced with holes, and are placed upright over a large cistern, into which the molasses—which is the portion of saccha-

rine matter that will not crystallize—drains away, leaving the raw Sugar in the state in which we see it in our grocers' shops. The casks are then filled up, headed down and shipped. In the French, Spanish and Portuguese settlements, it is usual to submit this raw Sugar to the further process of claying. For this purpose the Sugar, as soon as it is cooled, is placed in forms or moulds similar to those used in Sugar refineries, but much larger ; and these being placed with their small ends downwards, the top of the Sugar is covered with clay, moistened to the consistence of thin paste, the water contained in which gradually soaks through the Sugar, and washes out a further quantity of molasses, with which it escapes through a hole purposely made at the point of the earthen mould. It is then called clayed Sugar. The loaves, when removed from the forms, are frequently divided into three portions, which being of different colors and qualities, arising from the greater effect of the water in cleansing the upper portion, are pulverized, and packed separately for exportation.

The molasses which has drained from the Sugar, together with all the scummings of the coppers, are collected, and being first fermented, are distilled for the production of rum. The proportionate quantity of this spirit, as compared with the weight of Sugar produced, varies considerably with the seasons and mangement. In favorable years, when the Canes are fully ripened, and the quality of the Sugar is good, the proportion of molasses and scummings is comparatively small, and the manufacture of rum is consequently lessened ; the proportion usually made is reckoned to be from five to six gallons of proof spirit, for every hundred weight of Sugar.

The Sugar-Cane grows freely in climates colder than its own, if kept in a stove in a very rich, loamy soil. It may be increased, by suckers, or if a part of the stem be laid in a trench in the tan-pit, or in rich loam, where it has bottom heat, it will form plants at every joint. This plant, whose sweet and palatable juice, which, like gentleness, is pleasant to all, and yet, when excited, changes to a powerful alco-

holic stimulant of the most subtle qualities, emblemizes the sentence, SUAVITER IN MODO, FORTITER IN RE—Gentle in manner, vigorous in deed.

Flowers, and their Language.

Flowers, remarks a writer, are a delight to every one; to some, perhaps, merely for their beauty and fragrance; to others, independently of those acknowledged charms, for the varied pleasurable associations and thoughts which they suggest. And foremost among these is the assurance they afford of the exuberant goodness of God. The provision which is made of a variety of objects not necessary to life, and ministering only to our pleasure, shows a further design than that of giving existence: it speaks an intention to superadd pleasure to that existence. And who does not feel this when he looks on the hedgerow and the mead—

> Full of fresh verdure and unnumbered flowers,
> The negligence of Nature?

Nor is this the only lesson they impart; they remind us, also, of the superintending providence of the Almighty. After contemplating the more stupendous features of creation, "the heavens, the works of His fingers, the moon and stars which He has ordained," till overwhelmed with a sense of littleness, we exclaim, almost with feelings of despondency, "Lord, what is man, that thou art mindful of him; and the son of man, that thou visitest him!" has not the sight of an earthly flower, so carefully provided for, so exquisitely wrought, and so lavishly endowed with fragrance, recalled the mind to its proper tone, and given emphasis to the question, "Are ye not much better than they?"

But it is when viewed as types of the resurrection, that

they most vividly affect the imagination and touch the heart. The same inspired volume that tells us, "All flesh is grass, and all the goodliness thereof as the flower of the field;" reminds us, also, that "that which is sown is not quickened except it die." When, therefore, after the dreary, deathlike months of winter, we see the prodigies which divine power performs, clothing each tree and flower with its peculiar and appropriate beauty, who but must acquiesce in the conclusion of the poet, and say—

> Shall I be left abandoned in the dust,
> When fate, relenting, lets the flower revive?
> Shall Nature's voice, to man alone unjust,
> Bid him, though doomed to perish, hope to live?
> Is it for this fair Virtue oft must strive
> With disappointment, penury and pain?
> No; Heaven's immortal spring shall yet arrive,
> And man's majestic beauty bloom again,
> Bright through the eternal year of love's triumphant reign!

If we may believe modern interpreters, the language of flowers was known to the ancients, and it would appear that the Greeks understood the art of communicating a secret message through the medium of a boquet. It is only necessary to consult the Dream-book of Artemidorus, to be convinced that every individual flower of which the wreaths of the ancients were composed, conveyed some particular meaning. At all events, it is evident that garlands were conspicuous in the emblematic devices of antiquity.

The poets have not neglected to avail themselves of the opportunities thus offered, and among the rest, Shakespeare, who has evinced in several of his plays a knowledge and a love for flowers, but in no instance has he shown his taste and judgment in the selection of them with greater effect than in forming the coronal wreath of the maniac Ophelia. The Queen describes the garland as composed of Crowflowers, Nettles, Daisies and Long-purples; and there can be no question that Shakespeare intended them all to have an emblematic meaning. They are all wild flowers, denoting

the *bewildered* state of the beautiful Ophelia's own faculties; and the order runs thus, with the meaning of each term beneath:

Crow-flowers.	Nettles.	Daisies.	Long-purples.
Fayre Mayde.	Stung to the quick.	Her virgin bloom.	Under the cold hand of death.

A fair maid stung to the quick; her virgin bloom under the cold hand of death.

Flowers, the emblems and favorites of the fair, are not everywhere prized merely for their beauty and their perfume; in those regions where jealousy and custom condemn women to close imprisonment, and where love can employ only the language of looks and signs, invention has created symbolic phrases, for expressing the sweet sentiments of the heart. Castellan mentions that when he was passing through a lonely valley on the Bosphorus, his attention was attracted by a little country pleasure-house, surrounded by a neat garden. Beneath one of the grated windows stood a young Turk, who, after playing a light prelude on the tambour, sang a love-song, in which the following verse occurred:

> The nightingale wanders from flower to flower,
> Seeking the rose, his heart's only prize;
> Thus did my love change every hour,
> Until I saw thee, light of my eyes!

No sooner was the song ended, than a small, white hand opened the lattice of the window, and dropped a bunch of flowers. The young Turk picked up the nosegay, and appeared to read in it some secret message. He pressed it to his bosom, then fastened it into his turban, and after making some signs towards the window, withdrew. The gallant appeared from his dress to be nothing more than a poor water-carrier. But the Turkish proverb says, that however high a woman may rear her head towards the clouds, her feet nevertheless touch the earth. The girl was actually the daughter of a rich Jew, worth a hundred thousand piastres.

A nosegay, a garland of flowers, ingeniously selected and

put together for the purpose of communicating in secret and expressive language the sentiments of the heart, is called in the East a Saam, (salutation.) It often happens that a female slave, the object of the Sultan's favor, corresponds openly with her lover, merely by the various arrangements of flower-pots in a garden. Written love-letters would often be inadequate to convey an idea of the passionate feelings which are thus expressed through the medium of flowers. Thus, Orange flowers signify hope; Marigolds, despair; Sunflowers, constancy; Roses, beauty; and Tulips represent the complaints of infidelity. This hieroglyphic language is known only to the lover and his mistress; who often, as a matter of precaution, change the significations. As might be supposed, it is much employed in the harems of the East.

La Motraie, the companion of Charles XII., and Lady Mary Wortley Montagu, were the first who gave celebrity in Europe to the language of flowers. The few examples cited by Lady Montagu are not calculated to afford a clear and accurate idea of the principles on which the language is founded. Its spirit consists not, as might naturally be supposed, in the connection which fancy may trace between particular flowers and certain thoughts and feelings. Such an idea never entered into the heads of the fair inventresses of the Oriental language of flowers. They have contented themselves with merely taking a word which may happen to rhyme with the name of any particular flower or fruit, and then filling up the given rhyme with some fanciful phrase, corresponding to its signification. The language, therefore, consists not of individual words, but of whole phrases; and a flower or fruit expresses an idea suggested by the word with which its name happens to rhyme. Thus, for instance, the word Armonde (pear) rhymes, among other words, with Omonde, (hope;) and this rhyme is filled up as follows: Armonde, Wer bana bir Omonde, (Pear, let me not despair.)

The Turkish dialect, being rich in rhymes, presents a multitude of words corresponding in sound with the names

of flowers, or any other objects that may be selected; but these rhymes are not all admitted into the language of flowers, and the knowledge of this language consists in being acquainted with the proper rhyme. The vocabulary is not extensive, for the whole language scarcely exceeds a hundred signs and phrases. The celebrated Orientalist, Von Hammer, collected from the Greek and Armenian women, who are permitted to visit the harems, many of the phrases of this curious language which have been published.

In India, which may be regarded as the cradle of poetry, we are informed that it is customary to express by the combination of flowers those sentiments of the heart which are regarded as too refined and sacred to be communicated through the common medium of words. The young females of Amboyna are singularly ingenious in the art of conversing in the love-language of flowers and fruits. Yet this language, like that of Turkey and in other parts of the East, bears no resemblance to what we have hitherto been acquainted with in Europe; though according to the received notions, we are indebted for our first knowledge of this subject to the Crusaders and pilgrims to the Holy Land.

In early times it was customary in Europe to employ particular colors for the purpose of expressing certain ideas and feelings. The enamored knight indicated his passion by wearing a red and violet scarf; if he made choice of a reddish gray color, it was to denote that love had urged him to the combat; on the other hand, the combination of yellow, green and violet proclaimed his triumphant return from the conflict, and possession of the rewards of love. In the ages of chivalry, red was highly esteemed as the color of love, and accordingly the Rose was, on account of its tint, a favorite emblem. Thus, in the romance of *Perceforet*, a hat adorned with Roses is celebrated as the favorite gift of love; and in *Amadis de Gaul*, the captive Oriana is represented as throwing to her lover a Rose wet with tears, as the sweetest pledge of her unalterable faith.

Introduction to Botany.

The study of Lichens, remarks Lindley, is probably the most difficult of any part of Botany. The species are scarcely to be distinguished; the limits of the genera are uncertain, and the characters by which they are separated very obscure. Plants of this tribe have no parts in the smallest degree resembling flowers; they have no certain mode of multiplying themselves, except by the dispersion of little spores, which are nothing but exceedingly minute cells that are lodged in the centre of the shields. Take a full-grown shield of any one of them; with a sharp razor divide it perpendicularly; then shave off the thinnest possible slice of one of the faces, and drop it in water; place it on the glass stage of a microscope, and illuminate it from below. You will then be able to perceive that the kernel consists of a crowd of minute, compact fibres, planted perpendicularly upon a bed of cellular substance, and that in the midst of the fibres is a great number of little oblong bags, filled full of transparent cells; the bags are thecæ, the cells are spores, and it is to the latter the Lichen has to trust for its perpetuation.

They all consist of nothing but thin horizontal expansions of vegetable matter, in which a few harder and differently formed kernels or shields are imbedded. In some the color is yellow, brown or green, the texture of the expansion leafy, and the margin cut up into many lobes. In others, the expansion is merely a thin crust, which readily crumbles in pieces, the species having scarcely vital energy enough to keep the cells of which they are composed in a state of cohesion. They are all found chiefly in the temperate or colder regions of the earth. Some of them (Gyrophoras) crawl upon the surface of the earth, spreading their dingy, damp and cold bodies over whole plains, in the desolate regions of the north; others, as Usneas, spring up on the branches of trees, and hang down from them like gray and netted beards, giving the

unfortunate plants of which they take possession a hoary, wintry aspect, even in summer. Some, as Parmelias, overrun old walls, stones and rocks, to which they communicate those wild and agreeable tints which render ancient ruins so peculiarly pleasing to the eye; and finally, a fourth description, as Opegraphas, establish themselves upon the bark of living trees, occasionally burying themselves beneath the skin; through which their shields alone peep forth in the strange form of the letters of some Eastern tongue.

The Jungermannias look much like Mosses. They have little, roundish bodies, called anthers, and a theca elevated on a stalk. They are distinguishable, first, by their thecæ bursting into valves, and secondly by their spores being mixed with tubes formed of curiously twisted threads, and called elaters. They grow in damp and shady places, occupying the bark of trees and the surface of rocks and stones, or creeping among the herbage on the banks of rivers, on heaths, marshes, and in shady woods, and even inhabiting gloomy caverns where scarcely any other vegetable can exist.

Mosses are among the smallest of plants with true leaves; they are often so minute that the whole specimen, leaves, fruit, stem and all, would escape the eye, if they did not grow in patches; and they never, in the largest kinds, exceed the height of a few inches. They are usually the first plants that show themselves on rocks, walls, and barren places, where no other vegetation can establish itself. Provided the air is damp, they will flourish there, and in time lay a foundation of a bed of vegetable mould, in which the roots of grasses and other strong plants may find support, till they in their turn have decayed and prepared the way for shrubs and trees. This is the usual order observed by nature in converting the face of rocks into vegetable mould; and thus we may see Mosses have to perform the office of pioneers to larger plants—an office for which one would have supposed their Lilliputian size would have hardly qualified them. They are formed upon precisely the same plan as flowering plants, as

far as the arrangement of their organs of vegetation. They have in all cases a stem or axis, however minute, round which the leaves are disposed with the greatest symmetry ; they have the parts that answer to seeds inclosed in a case, and this case is elevated upon a stalk which arises from among the leaves. But beyond this, analogy ceases. In all other points of structure, the Moss tribe is of the most singular nature.

Mosses are said to be in fruit when the stems are furnished with brown, hollow cases, seated on a long stalk. It is chiefly this fruit or theca and its modifications that are made use of in distinguishing the genera. The thecæ wear a little cap with a high peak and long lappets, called a CALYPTRA ; when young, it is completely rolled round the theca, so as to completely cover it over like an extinguisher ; but when the stalk of the theca lengthens, the calyptra is torn away from its support and carried up to the top. After a certain time it drops off, and then is in the best state for an examination. It is terminated by a little conical lid, or OPERCULUM, which is thrown off when the spores or reproductive parts are fit to be dispersed. When the lid has been thus spontaneously thrown off, a new and peculiar set of parts comes in view ; the lid is covered with a kind of tuft of twisted hairs, which look at first as if they stopped up the mouth of the theca. Cutting the theca perpendicularly from the bottom to the top will show the origin of the hairs within the rim of the theca in a single row. These hairs are named in Botany the TEETH of the fringe, or PERISTÓME ; the latter term designating the ring of hairs. The nature of the fringe varies in different genera. Sometimes it consists of two rows of teeth, differing from each other in size, number and arrangement ; some have only four teeth, others eight or sixteen, thirty-two or sixty-four ; *in all cases their number is some multiple of four*—a curious circumstance, that shows the great simplicity of design that is observed in the construction of these minute objects. The fringe, however, is not present in all cases.

It is supposed to be useful in the dispersion of the spores. We have given a plate, showing a number of the Linnean genera. It is not necessary to be more minute in their description, as their names will be a sufficient index to those who would wish to know more about them.

It is in the inside of the theca that the spores are confined. They lie there in a thin bag, which is open at the upper end, and which surrounds a central column called the COLUMELLA. A superficial observer would remark no further organization than this ; but the accurate investigations of Botanists have led to the discovery that there is a more minute and concealed system of organs which in many cases precedes the appearance of the theca. It has been thought that these organs represent pistils and anthers of an imperfect kind ; but they are so imperfect and differently constructed from those parts that bear those names in flowering plants, as to render it extremely doubtful whether they can be really considered of the same nature. At the end of the shoots of some Mosses the leaves spread in a starry form, and become colored with brown. Among them lie a number of cylindrical, whitish-green bodies, which are transparent at the point and filled with a cloudy, granular matter, which it is said they discharge with some degree of violence, and from this are considered anthers. But their not existing in all the genera proves that they cannot be essential in fertilization. The second kind of apparatus is always present, being the forerunner of the theca. They first appear among the leaves as a cluster of little greenish bodies, which are thickest at their lower end, then taper upwards into a slender pipe, and at last expand into a sort of shallow cup. After a certain time the pipe and cup, which by some are considered style and stigma, shrivel up, and the lower part or ovary swells, acquires a stalk, and finally changes into a theca.

Intermediate between the Mosses and Ferns is the CLUB-MOSS tribe. Nuttall remarks that we have of these twelve or more species, several of them not uncommon in moist

woods, beneath the shade of evergreens. They send out creeping stems, at intervals giving off low, erect branches, clothed with evergreen, leaf-like, minute or Moss-like fronds. There are no veins in their leaves, which are for the most part narrow and taper-pointed. When about to reproduce themselves, they emit from the ends of their branches, which are usually forked, a slender shoot of a paler color than the remainder, and terminated by a yellowish, thickened, oblong or club-shaped head. Among the hair-pointed leaves of the head lie, one in the bosom of every leaf, pale yellow cases, opening by two or three valves, and containing either a fine, powdery substance, or a few large grains or spores, which are so abundant at certain seasons as to appear like a shower of sulphur, and much more inflammable. Although the Club-mosses are now seldom more than three or four feet long, and generally much smaller, it is probable that either similar plants, or races very closely allied to them, grew in ancient days to a size far beyond any thing that the present order of things comprehends. This, however, relates to Fossil Botany, which we will take up in its place and illustrate thoroughly, in a manner far beyond any thing that has yet appeared in this country.

We are now arrived at the frontiers of the third great province into which the vegetable kingdom is divided, and will soon complete the subject of *cryptogamic*, or flowerless plants. They have, in addition, the name of *cellular* plants, because their stems rarely contain vessels, but consist of cellular substance only. In nearly all plants that bear flowers, there is presented a curious system of air-pipes, the uses of which we will afterwards explain; on the other hand, in flowerless plants, spiral vessels are universally absent. Some of the more highly organized, as the Ferns, have a particular kind of vessel in lieu of the spiral; but all the other tribes are destitute of vessels of any kind.

Ferns are the most completely organized of flowerless plants. In the northern parts of the world, they are green

leafy productions, which die down to the ground every year, and are seldom more than two or three feet high. But in tropical countries, many of them far surpass these pigmy dimensions; they acquire real trunks, resembling those of Palms, and often rise to as high as forty or fifty feet, without a leaf. At all times they are graceful objects, from the slender wiry stems on which they bear their leaves, which wave in the breeze like plumes of feathers, and from the multitude of leaflets into which they are cut, with the most exquisite regularity. But the Tree Ferns of the tropics are said to be most superb objects, combining the grace and agreeable color of their European kindred with the majestic aspect of the Palms. It is usual to call their leaves by the name of Fronds, as if they were not analogous to those of other plants. The word was coined a long time since. to accommodate the existing notion, that a Fern leaf was a compound of branch and leaf; and as that has been proved false, it is much better to call it by the name it bears in other plants.

Holding a newly-formed leaf of a Fern up to the light, will readily bring in view a venous distribution, dissimilar to that of all other plants—neither netted nor parallel, but simply a forked structure. Although, now and then, one vein may be found running straight from the midrib nearly up to the margin, yet the principal part forks very soon after the vein has left the midrib, and sometimes one of the branches forks again. This is peculiar to Ferns, and will enable us at all times to recognize them. After the leaf has been growing some time, a number of narrow pale bands may be remarked at pretty equal intervals upon some of the veins, and following their direction. Presently afterwards, the whole of the skin of the leaf where these bands are, separates from the green part below it; in course of time something swells and raises up the skin till at last it bursts through it, separating the skin into two equal parts, one edge of which remains adhering to the leaf. At this period, the cause of the swelling is discovered; it consists in a multitude of brown seed-like

grains, that are crowded together very closely and form a brown ridge. The skin which separates from the leaf is called the INDUSIUM, the ridge SORUS, and the seed-like grains THECA. If a leaf is cut across a sorus just after the indusium has burst, the edges of the last will be distinctly visible, with the ridge-like receptacle of the theca rising up between them. The Fern leaf on our plate is reversed, to show the sori in rows; one of these rows is separated and apart and uppermost, two of the thecæ with three-jointed stalks shown, one at each end of the curve; just below these, and much smaller in proportion with the leaf, is another set of two. The theca is not a seed, nor yet a body similar in its functions. Each of them contains a large number of extremely minute oval grains, called SPORES, in which the power of increase resides; every one of them will form a new plant. How simple is all this! and yet, no doubt, as perfectly adapted to the multiplication of Ferns as any more complete contrivance. The power these plants possess of disseminating themselves is prodigious. Hart's-tongue—Scolopendrium—is one of those in which the power of increase resides only in a small degree. Each of its sori will average 4500 thecæ; as there are 80 of these on a single leaf, there must be 360,000 thecæ per leaf; each theca contains at least 60 spores; so that a single leaf of Hart's-tongue may give birth to no fewer than twenty millions of young plants!

It will be found in the study of cryptogamous plants, that there is one great peculiarity in them, independently of all others, in no two tribes agreeing exactly in their organs of propagation. While in flowering plants one tribe is distinguished from another by slight variations in the form, or number, or proportions of a few organs they all possess in common, it will be found among flowerless plants, on the contrary, that every tribe has an independent and peculiar provision of its own for the perpetuation of the species.

Those tribes we have just reviewed, were the first with which the Creator clothed the surface of the earth on the third

day of its creation, as will be found by referring to the first chapter of Genesis, where each class of plants is mentioned in order, beginning with the Cryptogami, and contradistinguishing them from *herbs yielding seed.*

Medical Department.

The Iceland Moss—Cetraria Islandica—loses in the dried state, such as we find it in the shops, a considerable portion of its green tints. When dried, it is variously colored, generally a grayish-white or light brown. It has no smell, and a rather bitter gummy taste ; sometimes quite astringent. Its bitterness, as well as the purgative quality which it manifests in its recent state, are in a great measure dissipated in drying, or may be extracted by a slight infusion in water, so that the inhabitants of Iceland convert it into a tolerably grateful and nutritive article of food. It is collected by the inhabitants of this northern region, and after being washed, is either cut in pieces, or it is dried by the fire or in the sun, and then put in a bag which is well beaten ; it is ultimately worked into a powder by being trampled on, and in this state is used for food. An ounce of this powder, boiled a quarter of an hour in a pint of water, yields seven ounces of mucilage as thick as that procured by the solution of one part of Gum Arabic in three of water.

Dr. Herberger extracted a bitter principle from Iceland Moss, which he called cetrarine. After coarsely powdering the Moss, he boiled it for thirty minutes in four times its weight of alcohol, (spec. grav. .883.) After cooling he squeezed the whole through a fine linen bag, and then poured on it diluted muriatic acid, or spirits of salt, (Acidum Hydrochloricum,) in the proportion of three drams to every pound of Moss. Four times the bulk of the liquid was added of

water, and the mixture left for twelve hours in a well-stopped bottle. A deposit is thrown down which must be collected on a filter, allowed to drain off its moisture, and then pressed. It is now broken in small pieces while still moist, washed with alcohol, taken out, put in an open vessel, and two hundred times its weight of boiling alcohol poured on it, which while hot will dissolve the cetrarine alone, but, unable to return but very little of it when cold, allows it to fall to the bottom while cooling; what does not fall is obtained by evaporation. One pound of Moss yielded Dr. Herberger 133 grains of cetrarine. It is exceedingly bitter to the taste, of a white color, very light and without smell, and remains unaltered by contact with air. In doses of two grains every two hours, it has been used successfully in intermittent fevers.

The medical properties of Iceland Moss were probably first learned from the Icelanders, who employ it in its fresh state as a laxative; but when deprived of this quality, and properly prepared, it was formerly in great request as an efficacious remedy in consumptions, coughs, dysenteries and diarrhœas. That it is a mild, nutritious tonic, or strengthener of the powers of the stomach, there can be no doubt; but beyond this, its powers are doubtful. It is usually employed in the form of decoction, and some writers recommend soaking it some time in water before boiling, to deprive it of its bitter principle: a wrong practice, as it is from this we expect most of the benefit.

Decoction of Iceland Moss.—Take of the Moss *one ounce; water one and a half pints.* Boil down to a pint, and strain by pressure through linen. This quantity is taken in divided doses, during twenty-four hours.

An ounce and a half of the Moss is often boiled in a quart of milk, and strained, and a teacupful drank frequently in the course of the day. When the milk does not offend the stomach, this is without doubt the most strengthening mode

of taking it. Care ought to be taken to have it boiled over a slow fire, and not longer than fifteen minutes.

The ash-colored ground Liverwort, one of the Lichens, has a weak, faint smell, and a sharpish taste. It was for a long time highly extolled as a medicine of singular virtue in hydrophobia, but is now deservedly forgotten.

Three varieties of Aloes are imported into this country—the Cape, Socotrine and Hepatic. The Cape Aloes reaches us from the Cape of Good Hope, by way of England. It is by far the cheapest, and this, together with its excellent qualities, causes it to be extensively used. It comes to us in casks or boxes. In winter it is brittle and easily powdered, but in warm weather becomes soft and tenacious. The odor is strong and disagreeable, and the taste bitter and unpleasant to the last degree, remaining a long while in the mouth. The German writers call this Shining Aloes, from the smooth, glassy substance it presents when freshly broken. Its color is of a dark olive, approaching to black.

The Socotrine is produced from the island that bears its name. It is exported in skins, and but little ever reaches the United States. The principal difference between this and the Cape, is in the color of its powder, which is of a bright golden yellow, while that of the latter is a dirty greenish yellow. The smell is peculiar, and neither it nor the taste so unpleasant as the other.

The Hepatic is prepared in the West Indies and Spain; its odor and taste are more nauseous than the two first mentioned, though not so bad as the Horse Aloes, which is much too foul for use.

By the analysis of chemists, the Aloe has been found to consist of extractive matter, resin and albumen; and various processes are given for obtaining these results, which of course would be out of place in a popular work. Cold water and alcohol will each extract its valuable qualities. Long-continued boiling injures it. The watery solution keeps a long time without being impaired in character.

Dioscorides and Celsus, with some other old writers, recommend very highly this drug, as a cathartic or purge, which operates slowly but very certainly, clearing out the whole intestinal track. It was formerly supposed to have a specific action on the lower portion of the bowels; but this is a mistake: its action is on all alike. Some consider that it acts specifically on the womb in bringing on the menses. It also slightly stimulates the stomach. There is one peculiarity in the action of Aloes which we do not often find in other medicines, and that is, the fact of our not being able to produce greater effects from greater doses. Where piles exist, or where there is an inflammatory tendency, it should never be administered.

The medium dose, when taken alone, is ten grains; but two or three are enough when a laxative effect only is wished. To produce a decided impression, twenty grains may be given. The best mode of taking it is in combination with other substances, in the form of a pill; and we will mention some very excellent pills, and their properties.

Aloetic Pills.—Take of Aloes in powder, and Castile soap, of each *one ounce*. Beat them with water so as to form a mass, to be divided into two hundred and forty pills. The soap in this preparation is very useful in moderating its action. To operate smartly, take five pills. To remove habitual costiveness, one, two or three, before each meal, will answer.

Compound Pill of Aloes.—Take of Aloes in powder, any quantity; extract of gentian, just half that quantity; rub them well together, and they will mix thoroughly. To scent the whole, add a few drops of oil of cloves. This makes the best dinner-pill known. From one to four pills before eating, according to the effect desired, is a dose. They are rolled to the size of a pea.

A very excellent pill can also be made of equal parts of Aloes, Rhubarb and Castile soap, rubbed together, and two or three, the size of a pea, taken before eating.

Tincture of Aloes.—Take of Aloes in powder *an ounce;*

black liquorice, *three ounces ;* alcohol, *one pint*, and water, *one pint*. Let the materials remain in a well-stopped bottle for fourteen days, and filter through paper. The dose is from half an ounce, fluid measure, to an ounce and a half. It is very little used, and most assuredly the less the better.

Quacks take advantage of the fact of a large dose of Aloes having but comparatively little more action than a small dose, and in consequence fearlessly recommend ten, twenty, thirty, and in one instance, seventy pills at a dose! The safety of the unfortunate dupe is owing to the first two or three pills, that dissolve, causing the bowels to eject the contents, and thus throw off at once what would otherwise prove extremely injurious.

Sugar, at the present day, is only used in medicine as a vehicle for other remedies, and to relieve unpleasant coughs, in the form of candy.

Oak Bark is astringent and somewhat tonic. It is most commonly used in external applications to ill-conditioned ulcers, piles, prolapsus ani and leucorrhea. The decoction is often useful as a bath for children when internal medicines cannot be readily administered, and has in this way been employed in marasmus, or wasting away, scrofula, intermittent fevers, chronic diarrhea and cholera infantum. Some have recommended the powder of acorns in intermittent fever; and in Brunswick they mix it with warm ale, and administer it to produce a sweat in cases of erysipelas. A decoction of acorns is said to be proof against dysenteries and colics; roasted and bruised, they have been known to restrain a violent diarrhea. The dose of the powder is from thirty to sixty grains ; of the extract half as much, and of the decoction two fluid ounces.

Decoction of Oak Bark.—Take of Oak bark *an ounce ;* water *two pints*. Boil down to a pint, and strain.

Extract of Oak Bark.—Having well sliced and bruised the bark, pour upon it eight times its weight of pure water ; boil to one-half, and strain with pressure ; now boil down the

remainder to a proper consistence. In all these preparations the White Oak is the one to be employed.

Oak Galls are supposed to be the strongest astringent in the vegetable kingdom. They will almost entirely dissolve in water, with the assistance of heat. The soluble active matter consists of tannin in combination with gallic acid—nine-tenths of the former with one-tenth of the latter. Spirit, equally with water, will take up the virtues, and forms, besides, much the strongest preparation. The powder is, however, the best form; and the dose is from a few grains to half a dram. They are not much used in medicine, though said to be beneficial in intermittents. Dr. Cullen has cured agues by giving half a dram of the powder of galls every two or three hours during the intermission, and by it alone, or joined with cammomile flowers, has prevented the return of the paroxysms; but he gives an undoubted preference to the Peruvian bark. A fomentation, made by macerating half an ounce of bruised galls in a quart of boiling water for an hour, has been found useful in piles, prolapsus ani and fluor albus, applied cold. An injection, simply astringent, is made by diluting this fomentation, and used in gleet and leucorrhea. Its best qualities are developed in an ointment for the piles, which is used after the application of leeches. It is made by incorporating half a dram of camphor, reduced to powder by means of alcohol, with an ounce of hog's lard, and then adding two drams of galls in very fine powder. This ointment is very extensively employed, under some dozen—perhaps hundred—names, by the different advertising quacks.

The Oak Tree.

The ancients tell us that a loving couple named Philemon and Baucis lived together in the happiest harmony, to ex-

treme old age; and, content with their humble lot and the little which their labor procured them, they knew no higher wishes or wants. Jupiter and Mercury one day descended in human form, from Olympus, to visit the plains of Phrygia. Needing refreshment, they called at several houses and were refused admittance; but Philemon and Baucis, the poorest couple in that part of the country, received them in the most hospitable manner in their mean habitation. Baucis immediately heated water to wash the travellers' feet; and then set before them a rural repast of fruit, milk and honey. She also produced wine, which she had cultivated and made with her own hands; and as the quantity sustained no diminution, the aged pair discovered from this circumstance the superior nature of their guests, and hastened to offer up in sacrifice to them a goose which they had reared in their hut. The goose, however, escaped from their grasp, and sought refuge at the feet of the gods, who took the bird under their protection. On rising from the table, they ordered their kind hosts to follow them to the top of a neighboring hill. They there beheld a flood sweeping away the houses of their hard-hearted neighbors, whilst their cottage stood uninjured amidst the raging waters, and was transformed into a magnificent temple. Jupiter then promised to grant them whatever they wished; but they desired nothing more than to be the servants of his temple. The god graciously complied with their request, and they served in his temple for many years. At length, while they were one day conversing before the door of the edifice on the wonder of which they had been eye-witnesses, Philemon observed that Baucis was gradually changing into a Linden tree, and Baucis, that her husband was turning into an Oak. They calmly and cheerfully continued their conversation so long as they could see, and then took an affectionate farewell of each other. As trees they stood for ages before the temple, and were objects of veneration to all the adjacent country.

The ancients believed that the Oak, coeval with the earth, afforded food and shelter to the first of men. In the remotest antiquity, it was the symbol of majesty and strength, and as such, sacred to Jupiter, whom it sheltered at his birth on Mount Lyas in Arcadia. Among the Greeks, the Oak performed an important part in their religious ceremonies. The Oaks in the grove of Dodona in Epirus, near the magnificent temple of Jupiter, gave forth the oracles which were then promulgated by the priestesses. On the banks of the Achelous grew those Oaks whose acorns were the first food of mortals ; for there is no doubt but that acorns were the food of the early ages, and it was only when corn was cultivated, that acorns were neglected. The Dodonean Jupiter, the Fates and Hecate, were all crowned with Oak wreaths; and the heroes who sailed in the Argo chose for the mast of that vessel an Oak from the sacred grove of Dodona, which continued to counsel the adventurers by oracular intimations. As it was an object of such reverence, it is no wonder that the gods who were entertained by Philemon conceived they could not confer on him a more suitable recompense than to transform him into the Oak tree that was to overshadow the temple of Jupiter, into which his hut was changed. Hence, this tree became the emblem of *hospitality.*

A commentator remarks, that there is a word in the Hebrew Bible, which is often translated in our version *Oak*, but which is the name of a tree peculiar to the Eastern world ; this is the Turpentine tree. Abraham pitched his tent under an Oak ; and it was beneath the shade of one of these trees, that Joshua set up the tabernacle. In connection with Abraham, we would remark, that the story of Philemon and Baucis is evidently a heathenized version of the eighteenth and nineteenth chapters of Genesis, to which we refer those who wish to read the narration in its original purity and elegance. And this will not be the only opportunity afforded us in our work of showing the source from which many of the most

admired classic stories were taken, and thus prove that their ancient writers were more accustomed to dress up images than create them.

The Quercus Robur—English Oak—is in the class Monœcia, order Polyandria. The generic name is derived indifferently from *quero*, to inquire, because divinations were formerly given from Oaks by the Druids, or *quer*, fine, and *cuez*, a tree, from the sacred Misseltoe growing upon it. The essential characters are—Male: Calyx commonly five-cleft; corolla none; stamens five to ten. Female: Calyx one-leaved, quite entire, rugged; corolla none; styles two to five; seeds ovate, one. The specific name is derived from a word meaning strong, and not, as some suppose, red, and hence give it what they consider a proper appellation, *Rubra;* for the Red Oak is another species entirely distinct. The specific characters of the Robur are—Leaves subsessile; stalks single or two together. It is the natural order Cupuliferæ, or cup-bearing tribe, and from the Oak being in it, generally called the Oak tribe.

Further on, we shall explain the real origin of all the parts found in these plants, and the singular manner in which they change between the infancy of their flowers and their old age; but until then, but a feeble idea can be entertained, as Lindley remarks, of the wonderful power the parts of plants possess, of assuming unusual forms, after they have been once developed. If it be true that flowers are generally seen in a masquerade dress, as some Botanists poetically assert, it is certainly here that their disguise is the most impenetrable. In the Oak itself, the involucre is formed of a great many rows of scales, which gradually grow larger and harder and more numerous, and at last become what is called the cup of the acorn; a part that never would have been guessed to have been made out of a number of little leaves, if their successive changes had not been watched. The germ or ovary at first contains three cells, and each cell two young seeds; but in obedience to the constant command of nature,

one of the seeds grows faster than the rest, presses upon the other cells and seeds, gradually crushes them, till at last, when the acorn is ripe, all traces of them have disappeared. This will help to account for the great age to which the Oak generally attains, for seed-bearing in all cases shortens the term of existence in the members of the vegetable kingdom.

This tree constitutes the greater part of the forests of Europe, and spreads over the whole northern section of Asia, and also the northern parts of the coast of Africa. It is not found at all, as far as we know, in the United States, in which, Nuttall remarks, there are over thirty species, some of them evergreens, but the most part have their leaves falling off in the usual season; some have annual and others biennial fructification, or have the acorns produced in one or two different seasons. Speaking of timber trees, an English writer, from whom we shall draw largely, remarks, that timber is one of the most essential substances in the arts; and in every situation in which it has been found, mankind appear to have resorted first to it, for habitations, for domestic implements, for the means of transporting themselves and their property by land and water, and for the formation of the weapons, whether to be used in war or in the chase. In point of strength, durability and general application, Oak claims the precedence of all timber; and to England, which has risen to the first rank among the nations, mainly through her commerce and her marine, the Oak, "the father of ships," as it has been called, is inferior in value only to her most valuable institutions. The American Oak timber is said by some to be inferior to the Robur, as is the Oak from the central parts of continental Europe, especially in compactness and resistance of cleavage. The knotty Oak, the "unwedgeable and gnarled oak," as Shakespeare called it—and in these two words described its leading properties better than all the Botanists—when cut down at a proper age, say from fifty to seventy years, is really the best timber that is known. Some timber is harder, some more difficult to rend, and some less capable of being

broken across; but none contains all the three great qualities in so great and so equal proportions; and thus, for at once supporting a weight, resisting a strain, and not splintering by a cannon shot, the timber of the Oak is superior to every other. Excepting the sap-wood, the part nearest to the bark, which is not properly matured, it is very durable, whether in air, earth or water.

The White Oak—Quercus Alba—which is found throughout the United States and Canada, is extensively employed in ship-building, but inferior to the Iron Oak—Q. Obtusiloba—which is finer grained, stronger and more durable than the White Oak. The Mountain Oak is also very valuable in ship-building, as is the Swamp Chestnut Oak.

Important as the Oak is now in the arts, there was a period in its history when it was principally valued for its acorns. Cervantes, in his romance of Don Quixote, not only sets them before the goatherds as a dainty, but picks out the choicest as a dessert for the Countess herself. But it should be remembered that the Oaks with edible acorns are not of the same species as those we have been describing. The Italian Oak, which Virgil represents as the monarch of the forest, and of the elevation of whose top, the steadfastness of whose roots, and of whose triumph in its greenness over the lapse of ages, he gives a splendid description in the second book of his Georgics, was the one used for food. Though our species are of little use, except that of fattening hogs and other cattle and poultry, yet the Ilex, Ballota and Esculus Oaks of Europe have become celebrated for their esculent properties. The first of these is still common in the south of Europe, bearing a fruit which in its agreeable flavor resembles nuts. It long remained a delicacy, and was served up in the form of dessert. This is a slow-growing tree, and always found single and not in clumps. The Ballota is still very common in Spain and Barbary, and bears the most abundant and nutritive acorns. Upon these, which they found in the woods of Salamanca, the French armies depended for sub-

sistence during part of their warfare in Spain. Bartholin relates that the people of Norway use the acorns for food. The inhabitants of Chio held out a long time upon these alone; and in a time of scarcity in France, A. D. 1709, they recurred to this food. The people of Smorland take particular pains in their preparation; by first boiling in water and separating from the husk, and then drying and grinding, they supply themselves with a salutary and nutricious diet. In most cases, however, from one-half to one-third the quantity of corn-flour is added before baking. Nor need we be surprised at this, for some of the classic authors speak of the primitive inhabitants of Greece and Southern Europe, who, living in the forests which were planted by the hand of Nature, were supported almost wholly upon the fruit of the Oak. The Grecian poets and historians called these people *balanophagi*—eaters of acorns.

Whether the custom existed among the ancient Britons, or, as is more probable, was imported by the Saxons, who came from the thick forests of Germany, it is certain that during the time they held sway in England the fattening of hogs upon acorns in the forests was accounted so important a branch of domestic economy, that about the close of the seventh century King Ina enacted laws for its regulation. The fruit of the Oak then formed gifts to kings and part of the dowries of queens. So important was it, indeed, that the failure of the acorn crop is recorded as one of the principal causes of famine. One of the most vexatious acts of William the Conqueror, in his passion for converting the whole of the forests into hunting-grounds, was that of restricting the people from fattening their hogs; and this restriction was one of the grievances which John was called upon to redress, at the triumph of Runnemede, where his assembled subjects compelled him to sign *Magna Charta*. It is to be observed that swine's flesh was the principal food of most nations, in the earlier stages of civilization; and this is to be attributed to the extreme rapidity with which the hog species multiply.

When the oak stands alone, it is a spreading, rather than an elevated tree ; in that situation the timber is also said to be more compact and firm, and the crooked arms of the trees are better adapted for ship-building, than when the trees are close together. In thickly-planted groups, the oak will reach an elevation of eighty or a hundred feet before it begins to decay. The further this straightness continues in the stem, or what is called the *stick* or *butt*, the more valuable is the timber ; in some of the choicer trees, forty, fifty, and even sixty feet may be found without a single lateral branch, and of such diameter that even at the smaller extremity they will square to eighteen inches or two feet. The stubborn branches shoot from the trunk in a right-angled manner, and afterwards start this way and that. When the tree is in full leaf, this can scarcely be discerned, yet by going underneath it may be easily perceived, especially if compared with the ash. Those grown in groups are as valuable from their straight trunks, for beams and planking, as those grown singly, whose straggling arms make such excellent knees for ships ; and therefore, in order to secure a proper supply, not only for maritime but for domestic purposes, it is desirable to have them in both situations.

The trunk of the detached oak acquires by far the greater diameter, some of the old hollow trees, most of which are of this description, having a diameter of as much as sixteen feet in the cavity, and still a shell of timber on the outside sufficiently vigorous to produce leaves and acorns. The age to which the oak can continue to vegetate, even after the core has decayed, has not been fully ascertained ; but in favorable situations, it must be considerable. Evelyn, an English writer, counted, in the New Forest, three or four hundred concentric rings or layers of wood in the sections of some trees, each of the rings recording a year's growth. The same celebrated planter mentions oaks at the old residence of Chaucer, which could not have arrived at the size which they possessed in a less period than three hundred

years ; and though he does not say upon what evidence the opinion is grounded, Gilpin notices, in his Forest Scenery, a few venerable oaks that chronicle upon their furrowed trunks ages before the Conquest. Many lists have been made of enormous oaks, to give which would be out of place here ; but we will close our consideration of their size with the mention of Damory's oak, in Dorsetshire, which is the largest on record. Its circumference was sixty-eight feet ; and the cavity in it, which was sixteen feet long and twenty feet high, was, about the time of the Commonwealth, used by an old man for the entertainment of travellers as an ale-house. The dreadful storm of 1703 shattered this majestic tree, and in 1755 the last vestiges of it were used for fire-wood. Some oaks have been as celebrated for being the records of historical events, as others have been for their magnitude. Not a hundred years ago, the oak in New Forest, England, against which the arrow of Sir William Tyrrel glanced before it killed William Rufus, is said to have been standing, though in such a state of decay that Lord Delaware erected a monument to indicate the spot. The Royal Oak at Boscobell, in which Charles II. concealed himself after the defeat at Worcester, has disappeared ; and though several trees were raised from its acorns, the race appears now to be lost to vegetable history. An oak of still more venerable pretensions now stands, or lately stood, in Sterlingshire, under the shadow of which the Scottish patriot, Wallace, is reported to have convened his followers and impressed upon them not only the necessity of delivering their country from the thraldom of Edward, but their power of doing it, if they were so determined. Gilpin mentions one more ancient than even this—Alfred's oak, at Oxford, which was a sapling when that great monarch founded the University. The Charter oak, at Hartford, will long be venerated as the depository of the secreted Charter in 1687, when the people of Connecticut had no other resource for the preservation of their liberty from Transatlantic tyranny.

Oak is so much in demand, as to have become an object of great attention to planters ; and the plants are carefully reared by nurserymen, from the acorns. If the saplings are to be of considerable size when planted out in their permanent situations, they are several times transplanted in the nursery. The deformed ones are cut down to the ground, and then a young, vigorous, straight shoot is made instead of that which was deformed. Some of those who have paid considerable attention to the subject, are however of opinion, that although transplanting probably accelerates the growth a little, the advantage thereby gained is more than compensated by the deterioration of the timber, which is neither so strong nor so durable as that sown by the hand of Nature, or where it is to be allowed to remain without transplanting. Some of the species of oak, as the Ilex, may be treated as shrubs, and are very ornamental on lawns and in pleasure-grounds. In England, the American oaks are particularly praised for this purpose, more especially for the colors their leaves take in winter. The Q. Coccinea and Rubra have deeply-cut leaves, which become of a beautiful red in autumn, as do the leaves of the Q. Palustris, the most elegantly shaped of any. Our Q. Illicifolia, called Bear oak, which grows to the height of only two or three feet, and hence its name, because the bears can eat the acorns without climbing, is a great favorite in the English gardens.

It is the great amount of *tannin* the oak bark contains that renders it so generally used for tanning leather. That of the White oak and the Quercitron, or Black oak, is preferred above any of the others for this purpose. Of the former of these, Parkinson relates that the Indians extract an oil from the acorns, with which they prepared their food. We may remark here, that the Chinese use the coarsest leaves of the tea tree in the preparation of leather. Of all the European oaks, we are told that the Q. Pedunculata is most esteemed on the Continent. It is a magnificent tree. Some of them at this day, in the forests of Fontainebleau, measure, at the base

of the trunk, from thirty to thirty-six feet in circumference, rising often to the height of fifty feet without a single branch. This species very much resembles the White oak of our country, and has been often confounded with it.

The Cork Oak—Quercus Suber—is not so large a tree as the common oak. There are several varieties: a broad-leaved and a narrow-leaved, which are evergreens; besides other varieties which shed their leaves. The broad-leaved evergreen is however the most common, and it is the one from which the cork of commerce is chiefly obtained. It is mentioned by Theophrastus, Pliny, and some other ancient naturalists, as being well known in the days of the Greeks and Romans, the latter of whom used it for a variety of purposes, and among the rest for the stopping of bottles. They used it for floats to their nets and fishing-tackle; for buoys to their anchors; and when Camillus was sent to the capitol, through the Tiber, during the siege of the Gauls, he had a life-preserver of cork under his dress.

The cork oak is indigenous, or at least abundant, in Portugal, Spain, part of the south of France and Italy; on the opposite coast of the Mediterranean and the Levant. Spain and Portugal supply the greater portion of the Cork which is consumed in Europe. The cork is the bark which the tree pushes outwards, as is common to all trees; but here the outer bark is of larger quantity, and is more speedily renewed. When removed, there is a *liber*, or inner bark, below it, and from this the cork is reproduced in the course of a few years—while the tree is said to live longer and grow more vigorously than if the cork were not removed. The first time the cork is taken off is when the tree is about fifteen years old. The crop is thin, hard, full of fissures, and consequently of little value; and the second, which is removed about ten years after, is also of an inferior quality. After this, the operation is repeated once in eight or ten years, the produce being greater in quantity and superior in quality each successive time. According to Duhamel, a cork tree, thus

barked, will live one hundred and fifty years. The months of July and August are those which are chosen for removing the cork. The bark is cleft longitudinally, at certain intervals, down to the crown of the root, with an axe, of which the handle terminates in a wedge; and a circular incision is then made from each extremity of the longitudinal cuts. The bark is then beaten, to detach it from the liber; and it is lifted up by introducing the wedged handle, taking care to leave sufficient of the inner laminæ upon the wood, without which precaution the tree would certainly die. The bark being thus removed, it is divided into convenient lengths; and it is then flattened, and slightly charred, to contract the pores. This substance is the rough cork of commerce; and it is thus fit to be cut into floats, stoppers, shoe-soles and other articles of domestic use, by the manufacturer. The cork of the best quality is firm, elastic and of a slightly red color. cork burned in vessels of a particular construction gives the substance called *Spanish black*.

The oak from which the nut-galls of commerce are procured, Q. Infectoria, is minutely described by Olivier, in his travels. The species is very common in Asia Minor; but until the time of this traveller, we had very little information on the subject, although the galls were a considerable article of commerce. It is a shrub seldom exceeding ten feet in height. Olivier not only described it well, but introduced it into France, where it is cultivated as a garden shrub, and grows well in the open air. The gall is a morbid excrescence produced by the puncture of the Cynips Gallæ Tinctoriæ, (improperly, Diplolepsis Gallæ Tinctoriæ of Olivier.) This excrescence is of a globular form, with an unequal and tuberculous surface. It is developed on the young shoots of the tree, and contains within it the eggs which the insect has deposited. The best galls are gathered before the transformation of the insect, because in that state they are heavier, and contain more of the tannin principle. When the insect has left them, they are pierced from the interior to the surface—a fact that affords

a test to the purchaser. The best galls come from Aleppo. The substance of which they are composed is peculiarly astringent; of which, according to Sir Humphrey Davy, five hundred parts contain a hundred and eighty parts of soluble matter, principally formed of tannin and gallic acid.

The instinct by which certain insects choose for the nests of their future offspring the substance of various vegetable bodies, is one of the most curious provisions in the economy of Nature. After having pierced those bodies, they deposit their eggs; which being hatched, produce larvæ that are more or less fatal to the vegetable substance to which they are attached. An irritation is produced by the introduction of these insects, exactly resembling, in the conditions of increased heat and tumefaction, a swelling in the human body, from an irritating cause. The cellular tissue swells; the parts which were naturally long, become round; and the flow of liquid matter produces a change of organization, from which results a complete change in the external form of the organ. In this way the gall is produced. A gall is either simple or compound, as it contains one or more larvæ. Reaumur has given a minute and interesting account of the admirable mechanism by which this insect conducts its remarkable operations. It is provided with a needle in a sheath, which has most surprising powers of extension, derived from the peculiar construction of the whole body of the insect—so much so, that the needle can be extended to double the length of the animal itself; and thus, as we have seen, it forms a nest for its offspring, while the young, in the same manner, pierce their way out of the vegetable shell which has been their protection. In Spain, in the southern provinces of France and along the Mediterranean coasts of Africa, there is found in great plenty a small species of oak called the Kermes—Quercus Coccifera—which is remarkable for nourishing large quantities of a small insect, which, being gathered, forms an article of commerce called Kermes. The declivities of the Sierra Morena are covered with the Kermes oak;

and many of the inhabitants of Murcia have no other mode of living than gathering the Kermes, or Coccus Ilicis, an insect that from the scarlet dye it produces, as well as its natural affinities, belongs to the Cochineal family. Though formerly in great repute, the Cochineal—Coccus Cacti—has almost entirely superseded the insect scarlet dye of Europe.

A fine oak is one of the most picturesque of trees, confessedly the most venerable of all inanimate objects. It conveys to the mind associations of strength and duration which are very impressive. The oak stands up against the blast, and does not take, like other trees, a twisted form from the action of the winds. Except the Cedar of Lebanon, no tree is so remarkable for the stoutness of its limbs; they do not exactly spring from the trunk, but divide from it; and thus it is sometimes difficult to know which is stem and which is branch. The twisted branches of the oak, too, add greatly to its beauty; and the horizontal direction of its boughs, spreading over a large surface, completes the idea of its sovereignty over the trees of the forest. To crown its other excellences, no tree so well can bear up against the storm; indeed, it is supposed to acquire greater stability of root from every contest with the elements.

"Mark yonder oaks, superior to the power
Of all the warring winds of heaven they rise,
And from the stormy promontory tower,
And toss their giant arms amid the skies,
While each assailing blast increase of strength supplies."

Even a decayed oak—

"——— dry and dead,
Still clad with reliques of its trophies old,
Lifting to heaven its aged, hoary head,
Whose foot on earth has got but feeble hold;"

even such a tree as Spenser has thus described, is strikingly beautiful; decay in this case looks pleasing. To such an oak Lucan compared Pompey, in his declining state.

A wreath of green oak, called the civic crown, was the

most honorable reward among the Romans, for great achievements. It was allotted to him who had saved the life of a Roman citizen in battle. It was also decreed to Cicero, for detecting Cataline's conspiracy. Scipio Africanus refused the civic crown, for saving the life of his father at the battle of Trebia, on the ground that the act carried with it its own reward. The possessor of such a crown had a right to wear it constantly ; when he entered an assembly, all present, senators themselves not excepted, were obliged to rise ; and he was exempt from every kind of civil burdens and imposts. Divine honors were paid to the oak by the ancient Germans and Celts, who worshipped, under its form, their god Teut. Their priests, the Druids, offered sacrifices beneath it; their victims were crowned with oak leaves, and it was requisite that the piles of wood on which they were burned should be lighted with brands of oak.

Proud monarch of the forest,
That once, a sapling bough,
Did quail far more at evening's breath,
Than at the tempest now ;
Strange scenes have pass'd, long ages roll'd,
Since first upon thy stem,
Then weak as osier twig, Spring set
Her leafy diadem.

Perchance thy mid-day glory
Long since has pass'd away,
Yet who that views thy giant bulk,
Can link thee with decay ?
No blight is on thy leaves, no branch
From thy huge trunk is torn,
And still, in conscious might, thou laugh'st
The hurricane to scorn.

And many a Summer's bravery
Each ample bough shall grace,
And many an angry Winter storm
Thy hoary vigor brace,
Unless, at call of "hearts of oak,"
Beneath the axe thou bow,
To bear the brunt of battle's rage
And thunder of the foe.

To thee, but little recks it,
  What seasons come or go,
Thou lov'st to breathe the gale of Spring,
  And bask in Summer's glow;
But more to feel the wintry winds
  Sweep by in awful mirth—
For well thou know'st each blast will fix
  Thy roots more deep in earth.

Would that to me life's changes
  Did thus with blessings come!
That mercies might, like gale of Spring,
  Cause some new grace to bloom!
And that the storm which scattereth
  Each earth-born hope abroad,
Might anchor those of holier birth
  More firmly on my God.

Biographical Department.

JAMES LEE.

The subject of our sketch was born at Selkirk, in Scotland, in 1715, of respectable parents. Being a youth of very promising talents, he was sent to England, to be under the protection of the Earl of Ila, who received him with great kindness, continued his education, and gave him the use of his library. He had an early love for plants, and studied Botany at a period when few persons in England had any knowledge of the science. He became acquainted with Linneus when the prince of Naturalists visited England, and a friendship arose in consequence which was never changed,

"When the Northern Light admired in Sweden's bowers,
His winged insects and his rosy flowers;
Called from their woodland haunts the savage train,
With sounding horn, to count them on the plain—
As once, at Heaven's command, the wanderers came
To Eden's shade, and heard their various name"—

and gave to the world, among other proofs of his transcend-

ent genius, the *Philosophica Botanica*, Lee, who was then in partnership with Mr. Kennedy, a nurseryman and florist at Hammersmith, was able to design and execute the plan of transfusing into our language that masterpiece of science. He did not confine himself to a literal translation, but preferred adapting it to the popular taste. He commenced with the flower, as being the part most attractive to the young botanist. Linneus began with the root, and also, in laying down his principles, gave few or no examples; these he probably reserved for his lectures. The distinguishing merit of Lee's work is, that it abounds with examples; scarcely is a single axiom laid down that has not four or five illustrations. The great Linneus felt no jealousy at the manner Lee had adopted to diffuse Botany among his countrymen; but on the contrary, in testimony of his knowledge, named a new plant after him, LEEA.

But the knowledge of Mr. Lee was not confined to Botany. He was also an adept in Entomology, Conchology, and Natural History in general, of which he made a most superb collection; and this cabinet, possessing many unique specimens of insects and shells, is often quoted by Fabricius and other eminent authors. He sent out persons to different quarters of the globe, to collect new plants; and his extensive stoves, greenhouse and nursery were the emporium of all that was curious and interesting in Botany. He discovered what islands belonged to Europe and what to Asia, by the HEATH-ERICA, which is abundantly dispersed over Europe and Africa, but is not to be found in Asia, or any of its islands which once formed a part of that continent.

As might be expected from an author, Lee's garden was also open to the curious, nor was he ever backward in communicating knowledge—a fault with many of his contemporaries, one of whom, Mr. Miller, concealed the names of some rare plants he had received, and threw the papers containing the seeds into the Thames river, whence they were fished up by Mr. Lee, who thus astonished the covetous author of the

Gardener's Dictionary, by disclosing the names of the rareties which the latter wished to monopolize. Lee might have died rich, but he was notoriously generous, and cared not what expenses he was at for the attainment of rare plants—an instance of which we have already shown, in his purchase of the Fuchsia. He would often give away plants to those who could appreciate them, in preference to selling them to the rich, who merely purchased from motives of ostentation. He never concealed his methods of propagating plants; and he generally observed, that for want of insects to further the nuptials of plants, and a proper degree of ventilation, or rather, favoring breezes, or from some defect in the escape of the pollen from the anther, the seeds of stove plants are in general unproductive; and ever since his time, the plan of *artificial impregnation* he invented at Hammersmith has been kept up, always securing an increase, and proving the practical value of science.

Lee was an ardent enthusiast in pursuit of natural science; was conscientious in all his dealings, and generous to a fault; his garden, his house or his purse were ever opened to the claims of scientific persons; and his good education and temperate way of living secured him the love and esteem of all to a green old age. He had a kind and affectionate wife, and one son and three daughters; the eldest of whom (Ann) was so eminent as an artist, that her botanical drawings were considered *chef d'œuvres.* He had the good fortune to see all his children well married, and his son succeed him in business. Having completed his earthly career, he met the expected summons with patient resignation, and died July, 1795, at the advanced age of eighty, universally regretted by great and poor.

Blue Bottle.

The Centaurea Cyanus—Blue Bottle Centaury—is in the class Syngenesia, order Polygamia Frustranea. The generic characters are—Heads discoid; involucre imbricate; ray flowers larger than the rest, barren and often wanting; receptacle bristly; pappus hairy; achenia compressed. Specific characters—Involucre scales serrate; leaves linear, entire; the lower ones dentate.

> To cure the bees, dried Roses, Acorn juice,
> Athenian Thyme and Centaury conduce. Virgil.

The English botanical gardens, Phillips tells us, possess no less than upwards of seventy distinct species of this genus of plants, besides numerous varieties, all of which are natives of the Eastern World, none having as yet been discovered in America. Like the red Poppy, the Centaury is the corn-flower of all the European countries, as well as that of Persia, Egypt, Siberia, Tartary and Barbary; and although the species of this very extensive genus vary in character very considerably, they all seem to harmonize happily with the ruby Poppy and golden Corn.

In the natural system of classification, for which our readers ere this must have discovered our predilection, they are ranked among the Compositæ, which is one of the most natural and extensive families in the vegetable kingdom, the members that compose it being recognizable at all times, by their united anthers and flowers growing in a head. The generic name of these plants is derived from a Greek word meaning a Centaur; and fabulous history adds that it was so called after Chiron, a centaur, who taught mankind the use of herbs and medicinal plants. It is also related that he cured a wound that was inflicted by a poisoned arrow of Hercules, with the aid of one of these species of plants, from which circumstance it was called Centaury.

Ancient fable informs us that this flower was called Cyanus, after a youth so named, who was so devoted to the Corn-flowers that his chief employment was that of making garlands of them; and he seldom left the fields so long as his favorite flower was to be found, always dressing himself in the same fine blue color of the flower he so much admired. At length he was found dead in a corn-field, surrounded with the blue bottles he had gathered; soon after which, Flora changed his body into this flower, out of gratitude for the veneration he had for her divinity. Aimé Martin remarks that the beautiful blue of this flower, which is of the color of an unclouded sky, has made it the emblem of a tender and delicate sentiment, nourished by hope. This is *Delicacy.*

The Blue Bottle, or as some call it, though not with as much propriety, the Bachelor's Button—for it does somewhat resemble a bottle—has been taken from the fields to the garden, where the art of the florist has multiplied its florets and varied its color so much, that it has now become one of the summer favorites of the parterre, flowering from July to the middle of September. Its color formerly gave it the name, in England, of Blue Blow; for Dr. Turner, a writer of that country, called it, in 1564, by that name. Gerard, another writer of the same place, observes that it is called Blewe-bottle, Blewe-blow, Corn-flower and Hurtsickle—deriving the latter name from its injuring the sickle of the husbandman. He also adds that it is sown in gardens, and by cunning looking to, doth oftentimes become of other colors, and some also double. In Scotland it is called Blue Bonnets; in German, Dutch, Swedish and Danish, *Kornblume;* in French, *Bluet;* in Italian and Portuguese, *Ciano;* in Spanish, *Aciano Azulcio.*

A beautiful blue, almost equal to ultramarine, may be obtained from the Cyanus. After collecting a quantity of these flowers, pick out the petals or florets from the centre of the flower, which are of a darker blue than those of the outside, and pound them whilst quite fresh in a glass or marble

mortar so as to obtain the juice, to which add a small quantity of alum, and then put it into clean shells, for use. The outer florets will also give a blue, but, as might be expected, of a paler color.

The Cyanus is a hardy annual plant, naturalized in the United States and often found in old fields. Under the windows of our room in Bridghampton, at the east end of Long Island, where we spent some weeks last summer, was a large number of these beautiful flowers, in separate bunches, of various colors, white, blue and red. Although the whole formed one mass, the separate tints kept by themselves and did not mix; so that we do not think, as many have supposed, that they change at times from one color to another. They were somewhat over three feet in height. They will grow in almost any soil, and succeed best when sown in the fall. When planted in the spring, they seldom produce many flowers, and to transplant would materially injure them. The only care required, is to keep them free from weeds, and to thin them at a proper distance from each other, as they branch considerably.

While on the blue bottle, it would be perhaps well to mention another species of the genus, which is not so generally known, although much more admired by those acquainted with it; this is the Centaurea Moschata—Sweet Sultan—which is specifically distinguished by its roundish, involucre and ovate scales; the leaves lyrate dentate. Its purple flowers sometimes give it the name of Purple Sweet Centaury. It blooms with us a much longer time than the Cyanus, continuing from July to October. This honey-scented species of Centaurea is indigenous to the soil of Persia, and was first introduced into England during the reign of Charles I. Parkinson, speaking of it in 1629, says that he must needs adjoin to some corn-flowers he was mentioning, another stranger of great beauty, and but lately obtained from Constantinople, where the great Turk saw it abroad, liked it, and wore it himself, and all his vassals had

it in great regard, and it was obtained from them. It was sent to him by the name of *Ambreboi*, which name he was in doubt in regard to its origin, whether Turkish or Arabian, and hence called it from the place he had it, *Turcicus*. The Turks call it the Sultan's Flower.

With us it is a border-flower, producing the strongest plants when sown in the autumn; it should likewise be sown in spring to have flowers late in autumn. The Suavolens, or Yellow Sweet-Sultan, is another species, but considerably more delicate, distinguished by a round, smooth involucre; the lower leaves flat and broad-toothed; the upper ones lyrate at base. It was brought from the Levant, and bears sweet-scented flowers the color of its name. An English florist recommends raising these plants by sowing the seed upon a hot-bed, in the spring; from which they should be removed into separate pots when of a proper size, and forwarded by plunging them into other hot-beds until they have taken good root; after which time they should be gradually accustomed to the air, so as to harden them for the parterre of the open garden, where they will continue in beauty for a great length of time. From its being in the East made the emblem of supreme happiness, it stands with us for *Felicity*, in floral language.

Hymn to the Flowers.

Day-stars! that ope your eyes with man, to twinkle,
From rainbow-galaxies of Earth's creation,
And dew-drops on her lonely altar sprinkle
As a libation,—

Ye matin worshippers! who, bending lowly
Before the up-risen sun, God's lidless eye,
Throw from your chalices a sweet and holy
Incense on high,—

Ye bright mosaics! that, with storied beauty,
The floor of Nature's temple tesselate;
What numerous emblems of instuctive duty
Your forms create!

Your voiceless lips, O flowers! are living preachers;
  Each cup a pulpit, every leaf a book;
Supplying to my fancy numerous teachers
  From loneliest nook.

Flora's apostles! that, in dewy splendor,
  "Weep without wo, and blush without a crime;"
O, may I deeply learn, and ne'er surrender,
  Your lore sublime.

"Thou wert not, Solomon, in all thy glory,
  Arrayed," the lilies cry, "in robes like ours;
How vain your grandeur! ah, how transitory
  Are human flowers!"

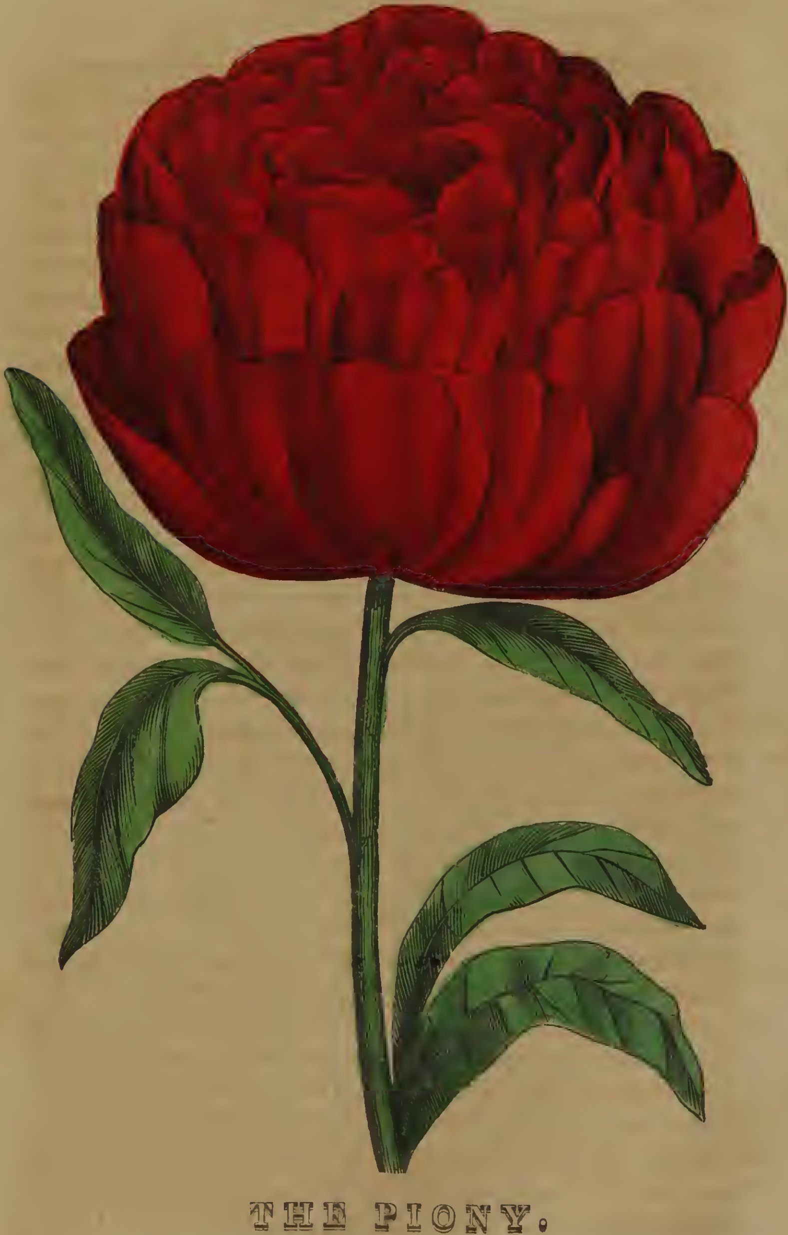
In the sweet-scented pictures, heavenly artist,
  With which thou paintest Nature's wide-spread hall,
What a delightful lesson thou impartest,
  Of love to all!

Not useless are ye, flowers, though made for pleasure;
  Blooming o'er field and wave, by day and night;
From every source your sanction bids me treasure
  Harmless delight.

Posthumous glories—angel-like collection!
  Upraised from seed or bulb interred in earth,
Ye are to me a type of resurrection,
  And second birth.

Were I, O God! in churchless lands remaining,
  Far from all voice of teachers and divines,
My soul would find, in flowers of thy ordaining,
  Priests, sermons, shrines! HORACE SMITH.

We are told that when St. Patrick went as a missionary to preach the gospel to the pagan Irish, it was difficult for a long time to give them an idea of the Trinity; but at last most happily accomplished his purpose by showing them a trifolium, or three-leaved grass (clover) with one stalk; this operating on their conviction, the Shamrock (the name for a bundle of clover) was ever afterwards worn upon the anniversary of the patron saint of Ireland, to commemorate the event.



THE PIONY.

The Orange Genus.

Oh! bring me one sweet Orange bough,
To fan my cheek, to cool my brow;
One bough, with pearly blossoms drest,
And bind it, Mother! on my breast!

Go, seek the grove along the shore,
Whose odors I must breathe no more;
The grove, where every scented tree
Thrills to the deep voice of the sea.

Oh! Love's fond sighs, and fervent prayer,
And wild farewell, are lingering there;
Each leaf's light whisper hath a tone,
My faint heart, e'en in death, would own.

Then bear me thence one bough, to shed
Life's parting sweetness round my head;
And bind it, Mother! on my breast,
When I am laid in lonely rest.

HEMANS.

——— The golden boast
Of Portugal, and western India there,
The ruddier Orange, and the paler Lime,
Peep through their polished foliage at the storm,
And seem to smile at what they need not fear.

COWPER.

In the class Polyadelphia, order Polyandria, is the genus CITRUS, characterized by a five-cleft calyx and fine oblong petals, about twenty anthers, and a berry containing from nine to eighteen cells. It is the type of the natural order, Aurantiaceæ, or Orange family, which are known by the leaves, flowers and fruit being filled with transparent receptacles of fragrant volatile oil. Leaves jointed once, at least, above the footstalk. Stamen situated above the style. Fruit fleshy. The genera are mostly natives of the Eastern world, naturalized in all the torrid regions, and cultivated in all civilized countries, for the beauty and fragrance both of flowers and fruit.

The generic name is derived from the Greek, meaning Citron, which tree is one of the species. The CITRUS

Aurantium—Sweet Orange—is specifically distinguished by the winged petals. Leaves oval, oblong and acute, finely scolloped on the rim. Fruit globose, with a thin skin and a sweet pulp.

While the greater number of tropical fruits are of little value to the many, there is a fruit, originally a native of the warmest regions, and naturally growing only in countries of a higher temperature than our own, which commerce has made our property in a very remarkable degree. The Orange may be procured at a little more cost than the commonest of our domestic fruits, while it is the most refreshing and healthy, perhaps, of all the fruits of the warm countries. It has thus become a peculiar blessing, for while it offers a gratification within the reach of the poorest, it is so superior to other fruits, that it cannot be despised for its cheapness, even by the richest.

This extraordinary consumption of a production which is brought here from distant places, is a natural consequence of certain qualities which fit the orange in a remarkable degree for being the universal fruit of commerce; for man may have it fresh in every region of the world, and at every season of the year; its aromatic oil and rind preserving it both from the effects of heat and cold, the acidity of the former also rendering it proof against the attacks of insects. It is true that oranges rot, like other fruits; but that does not happen for a long time, if the rind is uninjured and they are kept from moisture, and so ventilated as not to ferment.

Most of the oranges and lemons intended for exportation are gathered while still green; for if the fruit were allowed to mature, it would spoil in the transport. Lemons are sometimes preserved by being impregnated with sea-water. The gathering of lemons and oranges for the market generally occupies from the commencement of October to the end of December. Oranges are not fully ripe till the spring has commenced. It is remarkable that the trees from which the fruit is gathered green, bear plentifully every year; while

those upon which the fruit is suffered to ripen, afford abundant crops only on alternate years.

The orange was originally brought from India, and has prickly branches in its native country. It was most probably generally introduced into Europe in the early part of the sixteenth century. Sir Walter Raleigh was the first importer of oranges into England ; and it is said that his nephew, Sir Francis Carew, planted their seeds and produced trees from them. These trees were planted in the open garden, with a movable cover to save them from the inclemency of the winter months. They attained the height of eighteen feet, and the stems were nine inches in diameter, while the spread of the largest one was twelve feet the one way and nine the other. They were finally all destroyed by an unusually severe frost, after living many years. The orange trees at Versailles are during the winter wheeled into warm places under the terrace. At Hampton Court, in England, there are many orange trees, some of which are stated to be three hundred years old. They are generally moved into the open air about the middle of June, when the perfume of their blossoms is most delicious. Orange and lemon trees have been cultivated in the open air in England. For a hundred years, in a few gardens of the south of Devonshire, they have been seen trained against walls, and sheltered only with mats of straw during the winter. The fruit of these is stated to be as large and fine as any from Portugal.

The Citrus Medica—Citron—has naked petioles ; the leaves oblong and acute, and flowers with from thirty to forty stamens. When growing wild, it is a thorny tree about eight feet high. with leaves of a pale green ; the flowers are white, and have a very agreeable odor. The fruit is oblong, five or six inches in length, and has a tough, yellow rind. The outer part of it contains, as is the case with most of the family, a considerable quantity of highly aromatic and inflammable oil. The pulp is white and edible, and very acid, and preferred when prepared as a sweet-meat. Of a particular

variety of the citron, a conserve is made which is in great demand by the Jews, who use it in their Feast of Tabernacles. There are two varieties—the common and the sweet; but whether they have been produced by natural difference, or by culture, is not known.

The Citrus Limonum—Lemon—rises, in the form of a tree, to a height of from twelve to fifteen feet. The petioles are somewhat winged; the leaves of a dark, shining green color, oblong, acute and toothed; flowers with upwards of thirty stamens. It grows naturally in that part of India situated beyond the Ganges; but its transmigration to Europe belongs to the invasion of the West by those mighty caliphs who, from the heart of Southern Asia, extended their conquests to the foot of the Pyrennees, leaving everywhere traces of their power and their knowledge. The lemon, thus transported by the Arabs into every part of their vast empire where it would grow, was found by the Crusaders in Syria and Palestine, towards the end of the eleventh century.

By them it was introduced into Sicily and Italy, though it is probable that at the same period it was already multiplied in Africa and Spain. Arabic writers of the twelfth century speak of the lemon tree as then cultivated in Egypt and in many other places. Matthew Silvaticus, a writer of that time, says the lemon was then spread over all Italy. In the southern parts of Europe, where it abounds, there are many varieties. The rind is smoother than that of the citron; the bark of the tree is less smooth.

The Citrus Limeta—Lime—rises to the height of about eight feet, with a crooked trunk, which sends off a considerable number of prickly branches. It has naked petioles, and ovate, rounded, serrate leaves; flowers with thirty or more stamens. This small and shrubby tree is a native of Asia. The fruit is only an inch or an inch and a half in diameter, of a greenish-yellow color. It is not much cultivated in Europe; but from its greater sourness, and consequently more cooling properties, is a great favorite in the

West Indies. The Sweet Lime, or Bergamotte, is considered by many an intermediate between the lime and lemon. Of the latter fruit, the celebrated *Liqueur Curaçoa* is made. The Editor has seen it prepared, in the island from which it is named, by distilling the rind of the bergamotte with rum and sugar.

The CITRUS DECUMANA—SHADDOCK—rises in the form of a tree to the height of twelve or fourteen feet. It has winged petioles and obtuse emarginate leaves. The tree is imposing and showy, both in size and appearance, exceeding in both respects the orange, but is the least valuable or desirable of the genus produced in the West. The fruit is seven, eight and nine inches in circumference, and weighs fourteen and often sixteen pounds. It is a native of China and the adjoining countries, where the name of *Sweet Ball* is given it. There are many varieties, some with the pulp white, others with it nearly red; some that are sweet, with but little acidity, and some acid, with but little sweetness. It is of a greenish yellow color. The shaddock derived its specific name from having been first carried from China to the West Indies by Captain Shaddock. It has, however, been neglected there, and now but seldom merits its Oriental name of sweet ball. The planters have never been remarkable for their knowledge of science, or their skill in the new operations of the arts; and thus, instead of propagating the shaddock by budding, as is done in China, and which is the only way in which it can be improved, or even kept from degenerating, they have reared it from seed, and consequently have generally obtained a harsh and sour sort which is of little value.

It is a custom in France for the newly married to wear a head-dress of orange flowers. Formerly a dishonored girl was deprived of this ornament on her wedding day, a usage that still exists in the neighborhood of Paris. From this the orange flower has been made the emblem of CHASTITY.

The orange tree has been made the emblem of GENEROS-

ITY, being likened to a benevolent friend who is ever loading us with favors.

> Here orange trees with blooms and pendants shine,
> And vernal honors to the autumn join;
> Exceed their promise in the ripened store,
> Yet in the rising blossom promise more. POPE.

The whole genus thrives well in a mixture of rich loam with a little rotted dung; but great care is necessary not to overpot them, or give them too much water in a growing state. From these causes they often become sickly or yellow, and should then, florists direct, be turned out of the pots, and most of the old soil cleaned from their roots, and repotted in the mixture just recommended, after adding to it one-sixth its weight of powdered charcoal. In Europe they are frequently kept during winter in a cellar, almost without light or water, and brought into the open air during summer. The different species and varieties are generally propagated by budding and grafting on the common lemon, which grows readily from seed. This may be done at any time the sap is in motion. Some recommend March, so that when grafted on strong stalks they will make handsome plants in the autumn. Others think the most suitable time for budding is July and August. As soon as the operation has been performed, the plants should be placed in a close frame, on, not in, a moderate hot-bed. They are also frequently raised from seeds; but unless budded and grafted when about two years old, it will be many years before they flower. Orange trees may also be propagated by cuttings, which are best off the old wood, struck in sand in a gentle bottom heat and shaded. Plants raised in this manner flower and fruit much sooner than any others, but they scarcely ever attain a large size.

It has been well remarked, that in cold climates all we see of this genus are at the utmost either very small trees or shrubs, with brown stems, green twigs and leaves bearing some resemblance to the laurel; but that we cannot by such specimens judge of the size of the orange tree. In parts of

Spain there are some old orange trees, forming large timber; in a convent at Rome is an orange tree thirty-one feet high, which is said to be six hundred years old; and at Nice, in 1789, there was a tree which bore five or six thousand oranges, more than fifty feet high, with a trunk which required two men to embrace it. The size, of course, depends much upon the age of the plant. Lindley mentions, as an instance of its enormous productiveness, a single orange tree at St. Michael's which has been known to produce twenty thousand oranges fit for packing, exclusively of the damaged fruit and the waste, which may be counted at one-third more.

We will close our account of the orange, by giving its history from the pen of a writer to whom we are already indebted for much of the preceding information.

At the time when the people of Europe first visited the Levant in great numbers—that is, during the crusades for the recovery of Syria from the dominion of the Saracens—oranges were found abundant in that country. Though they were in reality cultivated trees, their number, and the beauty and goodness of their fruit, naturally caused the adventurers (who were not very conversant with Natural History, and not a little prone to romance and credulity) to believe and state that these were indigenous to the country, and formed a portion of the glories of the "Holy Land."

The fables of the profane writers, and the ambiguity of the descriptions of vegetables in holy writ, helped further to confirm this opinion. As the oranges were of the form of apples, and the color of gold, it did not require much stretch of imagination to make them the golden apples of the Garden of the Hesperides; and the only point that remained was to settle the locality of that fabled paradise, which was generally laid in the part of Africa which lies between the mountains of Atlas and the southern shore of the Mediterranean. The authority of Moses was called in to confirm the existence of this fruit in Syria, even at the time when the children of Jacob were wandering in the wilderness;

and one of the trees borne in the procession commanded in the twenty-third chapter of the book of Leviticus, was considered to have been the orange. The *mala medica* of the Romans, which is mentioned by Virgil, and afterwards by Palladio and others, the *kitron* of the Greeks, and the *citrus* of Josephus, were all understood to mean the same fruit; and, as has been found to be the case with many other substances, the moderns supposed that, because there was an identity of name, there must be an identity of substance—never reflecting that the name had been imposed by themselves, and that, therefore, its identity proved nothing.

The fable continued, however; and, though there was a good deal of writing upon the subject, there was no attempt to examine the authorities with that minuteness which the search of truth demanded, till the nineteenth century. The history of this fruit was first carefully traced by Galessio, who published his "*Traité du Citrus*," at Paris, in 1811. He maintains that the orange, instead of being found in the north of Africa, in Syria, or even in Media, whence the Romans must have obtained their "Median Apples," was not in that part of India which is watered by the Indus at the time of Alexander the Great's Indian expedition, as it is not mentioned by Nearchus among the fruits and productions of that country. It is not mentioned either by Arrian, by Diodorus, or Pliny; and even so late as the year 1300, Pietro di Cuescengi, a Senator of Bologna, who wrote on agriculture and vegetable productions, does not take the least notice of the orange.

The first distinct mention of oranges is by the Arabs; and Avicenna (book v.) not only describes *oleum de citrangula* (oil of oranges) and *oleum de citrangulorum seminibus*, (oil of orange seeds,) but speaks of *citric acid*, (salt of lemons,) which is contained in all the genus, though more abundantly in that species from which it got its common English name.

According to Galessio, the Arabs, when they penetrated to India, found the orange tribe there, further in the inte-

rior than Alexander had penetrated; and they brought them thence by two roots: the sweet ones, now called China oranges, through Persia to Syria, and thence to the shores of Italy and the south of France; and the bitter oranges, called, in the commerce of England, Seville oranges, by Arabia, Egypt and the north of Africa, to Spain.

It does not appear that the orange was originally a Chinese fruit, as it is not mentioned by Marco Polo, the father of modern travellers, who is so circumstantial in describing all the other wonders of that country.

Now these facts certainly go far to show that the orange was not known to the ancients either in Europe or in Syria; but that we are indebted for the first knowledge of it to the Arabs, who, with their zeal to propagate the religion of the Koran, were as anxious to extend the advantages of agriculture and medicine. The sweet orange which they introduced was not, strictly speaking, that which has since been called the China orange, and under that name introduced into Spain, Portugal, St. Michael's, the other Atlantic isles, and the West Indies; but rather the orange which was known in Italy before Vasco de Gama had doubled the Cape of Good Hope.

The orange is said to have been found by the Portuguese upon the east coast of Africa; but it is not known whether it had been indigenous there, or disseminated by the Arabs. When the Portuguese reached India, they found the orange there, and also in China, which was visited for the first time by sea in the early part of the sixteenth century.

Although the oranges of St. Michael, in the Azores, are now the best that are to be met with in the European market, they are not indigenous productions of that island, but were sent there by the Portuguese, as the same fruit was originally sent to the American continent by the Spaniards. In the middle of a forest on the banks of the Rio Cedeno, Humboldt found wild orange trees, laden with large and sweet fruit. They were, probably, the remains of some old Indian

plantations; for the orange cannot be reckoned among the spontaneous vegetable productions of the New World.

But, in whatever way oranges were first introduced into those parts of the world of which they are not natives, they are now very widely diffused; and wherever they are found they are among the most ornamental of trees, and the most delightful of fruits. The species and varieties have also been greatly multiplied; but whether from their proneness to produce varieties, from some original differences, or from difference of soil or climate, cannot now be ascertained. Including all the different species, Risso, an eminent naturalist at Nice, (and from his living in a country producing oranges, he had the best opportunities of examining and studying them,) has, in a very elegant and elaborate natural history of oranges, published at Paris in the year 1818, enumerated, described, and, with respect to all the more important sorts, figured no fewer than one hundred and sixty-nine varieties; these he has divided into eight species: sweet oranges, bitter oranges, bergamottes, limes, pampelucos, sweet limes, lemons and citrons.

Of the first of these there are no fewer than forty-three varieties; though, in the opinion of Galessio, they are all derived from the common orange. The others are, generally speaking, more acid in their flavor; though some of them, such as the bergamottes, from the rind of which the celebrated oil of bergamot is obtained, are highly perfumed.

Of the bitter oranges Risso enumerates thirty-two varieties; of the bergamottes, five; of the limes, eight; of the pampelucos, six; of the sweet limes, twelve; of the lemons, forty-seven; and of the citrons, seventeen.

There is something peculiar in the organization of all the fruit of the orange tribe. The rind or external pericarp of them all is a spongy texture, containing but little juice or sap of any kind in its substance; but the external surface is covered, or tuberculated over, with little glands that secrete a volatile oil which is very inflammable, more or less acid

according to the species, and of a very strong and pungent scent.

The family of the oranges, in some places in many of their varieties, are now cultivated in Portugal, in Spain, in France, in Italy, and in Greece. In the first two countries they especially abound—in Algarve, and in the fine plains of Andalusia, on the banks of the Guadalquivir. The latter is the place from which the bitter or Seville oranges are chiefly obtained. In Algarve and Andalusia the orange trees are of great size; and extensive orchards of oranges have formed the principal revenue of the monks for several centuries. In Cordova, the seat of Moorish grandeur and luxury, there are orange trees still remaining which are considered to be six or seven hundred years old: and in that province, whose craggy mountains are covered with gardens, and vineyards, and forests abounding in fruit, the flowers of the orange fill the air with their perfume, and lead the imagination back to those days which the Moorish poets and historians delight in describing, when the land which they conquered was adorned with all the refinements of their taste and intelligence, and the luxuries of the East were naturalized in the most delicious regions of the South. The trunks of the old trees of Cordova have begun to decay; and when they get diseased, they are crusted with a kind of lichen, which is supposed to be peculiar to the orange. In France, the orange country is chiefly Provence, or that part of the south which lies to the eastward of the Rhone; and plantations or groves of oranges are the most abundant and the most beautiful on the banks of the Var, and especially in the environs of Nice, where the species are very many, and come to great perfection. To the west of the Rhone, the country along the coast is flat, sandy and barren; and on the plains of Languedoc, that lie interior of this barren tract, the olive thrives better than the orange, apparently because there are no secondary mountains between the cold heights of the Cevennes and the plains. The country to the

eastward of the Rhone is much better adapted for choice vegetables, both in soil and in aspect. In the western or French part of it, the Alps descend gradually, by successive elevations, from the high summits of Mont Blanc, Mont Rosa and St. Bernard, to the sea. Thus the low grounds are finely exposed to the southern sun; and, being at the same time sheltered from every quarter whence a cold wind could come, the vegetation is at once luxuriant and choice. The finest bulbous flowers, the myrtle, the cactus, and many others, give more the air of the perpetual summer of the tropical countries, than is to be found perhaps in any other country of Europe—certainly in any other of the same extent.

The glory of that delightful country is the orange, which, when full grown, attains the height of about five and twenty feet, and is graceful in all its parts. The trunk and older branches are of a delicate ash color; the twigs of so soft a green that they almost appear transparent; the leaves are moderately large, beautifully shaped, of a fine healthy green, and shining on the upper sides, while the under ones have a slight appearance of down. The flowers, which are in little bunches, and very graceful in their form, are, in the sweet oranges, of a delicate white, and in the more acid varieties of the family, lightly marked with pink. Some plants have a more powerful odor, and are for the moment more rich; but there is a freshness in the aroma of an orange grove which never offends or cloys; and as the tree is at one and the same time in all stages of its bearing—in flower, in fruit just set, and in golden fruit, inviting the hand to pull and the palate to taste—it is hardly possible to imagine any object more delightful. The perfumes of Arabia do not exceed the fragrance of the groves on the north of the Mediterranean, in which the beautiful white Provence rose, the tuberose and countless other flowers, blend their sweets with that of the orange; and where, with all this richness, the pestilent airs of the tropics, and even the *sirocco* of the southern parts of

Italy, are altogether unknown. This delightful fertility and fragrance accompany the chain of the Appenines round the whole gulf of Genoa, and until, upon the boundary of the plain of Tuscany, they subside in elevation, and bend more toward the Adriatic.

Tuscany is further to the south; but the climate and the vegetation cannot be compared to those of the little valleys of Provence and Liguria, especially the latter. About Florence, there are still orange trees in the gardens; but there are none of those aromatic groves and plantations which are found further to the west. Nor are the causes difficult to find out. There is an enemy on each side of the plain of Tuscany, which will not allow the orange to arrive at perfection. The gales that come from the south-east, over the sandy shores near Leghorn, are not adapted for a plant which, as well as heat and pure air, requires a considerable quantity of moisture; and the winds from the north, that are cooled in passing over the Adriatic, are not so genial as those from the Alps, that are warmed in passing over the vale of Lombardy. But still the olives, the grapes and the melons of the vale of the Arno, in so far compensate the inhabitants for the want of the orange.

Eastward of Tuscany, though the coast of Italy inclines still further to the south, it is even less adapted for the production of the orange. The sea-coast is barren, the interior is dreary, and over the whole the pestilent *malaria* creeps, forbidding man to approach even for the cultivation of the fields; and thus it may be that, ere long, the arid downs by the sea will meet the marsh of the interior, and the centre of Italy shall be desolation to the very base of the Appenines. After the gulf of Gaeta is passed, and the shelter of the more elevated mountains of Calabria is obtained, orange groves again make their appearance.

Thus the locality of the orange depends fully as much upon situation and soil as upon latitude; and therefore we need not wonder that, considering the many and varied

lands in which it is cultivated, there should be so many varieties of its fruit. There is no absolute reason for supposing that the sweet and the bitter orange were originally different; and even now they are not so different as two mushrooms of the very same variety—the one produced upon a dry and airy down, and the other upon a marsh. Now, if it be true that the bitter orange of Seville came, by successive removals, from the head of the Persian Gulf, along the margin of the salt desert, till it reached the states of Barbary, where it was transplanted into Spain; if the sweet orange of Malta, Italy and France came through the more fertile parts of Persia and Syria; and if the orange of India and the Azores came direct from China; it would follow that each should have those qualities which we find in it, and that the opinion of Galessio is borne out by the only evidence which the case admits.

Looking at the facts, we are induced to infer, that, if the temperature be sufficiently high for maturing its flavor, the orange is delicious in proportion to the uniform salubrity of the air, and that those high temperatures which force a very large expansion of the fruit are against the fineness of its quality. In this respect, we have an opportunity of contrasting both the oranges of islands and those of continents. St. Michael's, in the Azores, and Malta, are both small islands; the former always exposed to the equalizing breezes, which, from whatever quarter they blow, are always wafted across the expanse of the Atlantic; and the latter lying near the dry and sultry shores of Africa, and, of course, subjected to more changes of season and a higher temperature. There is also some difference in the soil. Whether it be the decomposition of the rock, or saline particles brought by the same pestilent wind that withers the south of Italy and Sicily with the *sirocco*, it is well known, that under the artificial earth (brought originally from Sicily) which forms the soil of Malta, there gathers a crust, and that if the earth be not trenched, and this crust removed at the end of a

certain number of years, it ceases to be productive, or the produce becomes so bitter that it is not healthful. St. Michael's has no such disadvantage; the soil there is native and fertile, and deposits nothing calculated to injure its fertility, or impair the qualities of its produce.

The oranges of the two islands are such as one would expect from those differences: the Maltese orange is large, the rind is thick and spongy, the glands that secrete the volatile oil are prominent, the pulp is red, and there is a trace of bitterness in the taste; while the St. Michael's orange is small, the rind is thin and smooth, the glands less prominent, the volatile oil in smaller quantity, and the lighter colored pulp more sugary and delicious. Some allowance must no doubt be made for the original differences of those oranges, regarding them as having come in the manner stated by Galessio; but they have now been long enough in both islands for having their qualities modified by the different climates and soils.

The modifications produced by differences of soil and climate, in the same vegetable, are among the most important inquiries in the science of plants; and they are at the same time among the most difficult, and certainly the least attended to. One principal source of the difficulty lies in the observer being as much changed as the thing observed. Those who are parched with thirst do not stop to analyze the water, or descant upon the flavor of whatever beverage they may have recourse to for slaking it. The removal of the painful sensation is to them far more delicious than the purity of the most limpid spring, or the flavor of the choicest wine. Just so with man when he is panting under a burning atmosphere: the fruit which is most delicious to him is that which is most cool. This necessary change in the judge, as well as the thing judged of, must never be omitted when we come to compare the fruits of different countries, as reported of by those who have enjoyed them there; and we never can be certain of their real merits till we have them decided by the

same individual under the same circumstances. To take a case in point: a guava, apart from its rarity, is certainly not in this country any thing comparable to a peach; and yet those who have been in tropical countries talk in raptures of the guava, and say that the fruit grown here is inferior and degenerated. But they should bear in mind, that in the tropical countries there is the tropical zest, as well as the tropical flavor. The man who traverses a mountain country in the north, heeds not the glittering fountains that issue from every rock around him; but send him from Suez to Bassora, or from Morocco to Fezzan, and he would remember them with veneration.

But, again, we have a further confirmation when we compare the continental oranges. The climate of the slopes and valleys of the Estrella, near the lower Tagus, and that of the Maritime Alps and the Appenines, in Provence and Liguria, are certainly very different from the climate of Andalusia. The diversities of surface, and the vicinity of the sea, keep the air over the former places in continual play and motion, and prevent those intense heats which unquestionably render the juices of plants acid, acrid or saline; while, from the wider extent of Andalusia, and its comparative distance from the ocean, the air over it is, in the warmer months, much more quiescent.

These considerations will, to a certain extent, explain why there are so many varieties in a fruit, which, according to the authorities, appear all to have come from the same part of the world; and a further extension of these considerations would form a criterion of the situations in which it would, or it would not, be desirable to cultivate the orange.

Oranges have been found in which a second fruit is produced in the inside, agreeing in all respects with the outer, even to the peel.

The Orange Tree.

PLANTED as an anchor cast,
Deep the root, and strong, and fast,
Sending, viewless through the vale,
Virtue, like a living soul,
Spread in branches high and wide,
Full and fair on every side:
By its growth and produce found
Sound at heart in healthful ground;
Through the circling season known
For a beauty all its own,
As a child of God should be,
Mark the goodly Orange tree!

Rich its leaves of evergreen
Polished to a mirror sheen;
There among them all about,
Where the buds of pearl peep out,
While the silvery blossoms fling
Odors on the breeze's wing,
Fruit in globes of mellow gold
On the self-same bough behold!
Then, while sunbeams o'er it shed
Weave a glory round its head,
Crowned of Heaven as Faith shall be,
Stands the generous Orange tree.

Bosomed in its fragrant bloom,
Sits the bird to soothe her plume;
Then, for rest it gives her wings,
Thanking heaven, her carol sings.
There the joyous bee distils
Nectar which her barrel fills,
Still replenished in its bower,
Leaves unharmed her fountain flower.
Though the spring be hid from sight,
Bright the works come forth to light;
Sweet to man, and bird, and bee,
Is the peerless Orange tree.

Oh! by one fair tree alone
Is such living virtue shown?
What then is the owner's love
Towards his blooming Orange grove?
Through it with a jealous care,
Rooting out the wilding there,
Walks he raptured at the sight,
And with breathings of delight:
So doth her kind Master search,

With the fire of love, his Church,
On his holy ground to see
No untrue or barren tree.

Man, if thou wouldst win the crown
Which to give, thy Lord came down,
Of those holy sisters three,
Faith, and Hope, and Charity,
Peaceful in their works sublime—
Mid the scenes of earth and time—
Still with heavenly ardor fired,
Never changing, never tired—
See the grace and love divine
Through this arbor symbol shine!
Full of life unfading be
Thou to Christ a fruitful tree!

HANNAH F. GOULD.

Moss Rose.

Mossy Rose on mossy stone,
Flowering 'mid the ruins lone,
I have learnt, beholding thee,
Youth and Age may well agree.

Balmy germ of freshest hue,
Out of ruin issuing new;
Moss, a long, laborious growth,
And one stalk supporting both.

Thus may still, while fades the past,
Life come forth again as fast;
Happy, if the relics sere
Deck a cradle, not a bier.

Tear the garb, the spirit flies,
And the heart, unsheltered, dies;
Killed within, the nursling flower
Scarce survives the green an hour.

Ever thus together live,
And to man a lesson give:
Moss, the work of vanished years;
Rose, that but to-day appears.

Moss, that covers dateless tombs;
Bud with early sweet that blooms:

> Childhood thus, in happy rest,
> Lies on ancient Wisdom's breast.
>
> Moss and Rose, and age and youth,
> Flush and verdure, hope and truth;
> Yours be peace that knows not strife,
> One the root and one the life. JOHN STERLING.

The queen of flowers having found the corpse of a favorite nymph, whose beauty of person was only surpassed by the purity of her heart and chastity of her mind, resolved to raise a plant from the daughter of the Dryads, for which purpose she begged the assistance of Venus and the Graces, as well as of all the deities that preside over gardens, to assist in the transformation of the nymph into a flower that was to be by them proclaimed queen of all the vegetable beauties. The ceremony was attended by the Zephyrs, who cleared the atmosphere, in order that Apollo might bless the new-created progeny by his beams. Bacchus supplied rivers of nectar to nourish it, and Vertumnus poured his choicest perfumes over the plant. When the metamorphosis was complete, Pomona strewed the fruit over the young branches, which were then crowned by Flora with a diadem that had been purposely prepared by the celestials to distinguish this queen of flowers. Let any of our readers imagine a more exquisite mode of relating the story of a rose springing from the grave of a friend, than this one of the Roman poets, which we have extracted from Phillips.

The ancients tell us that roses were originally white, but were changed to red by the blood of Venus, when her feet were lacerated by their prickles, in her attempts to protect Adonis from the rage of Mars.

> While the enamored queen of joy
> Flies to protect her lovely boy,
> On whom the jealous war-god rushes,
> She treads upon a thorned rose,
> And while the wound with crimson flows,
> The snowy flow'ret feels her blood and blushes!

Others have stated that Love, in a feast of Olympus, in the

midst of a light and lively dance, overthrew, with a stroke of his wing, a cup of nectar, which precious liquor falling on the rose embalmed it with that delightful fragrance it still retains. The best method we have ever heard of effecting the transformation, was that given by Henry Drummond in an impromptu while presenting a white rose to a lady of the Lancastrian party :

> If this pale rose offend thy sight,
> It in thy bosom wear;
> 'Twill blush to find itself less white,
> And grow Lancastrian there.

But we will pursue this theme no further, as we have some thoughts of devoting an entire number to the Rose ; and since we have sketched just lightly enough over its history to obtain an idea of the mode of its creation, we will finish the tale of transformations by the last grace added to its peerless beauty :

> The Angel of the Flowers, one day,
> Beneath a Rose tree sleeping lay—
> That Spirit to whose charge is given
> To bathe young buds in dews from heaven.
> Awaking from his high repose,
> The Angel whispered to the Rose :
> " O fondest object of my care,
> Still fairest found where all are fair,
> For the sweet shade thou'st given to me,
> Ask what thou wilt, 'tis granted thee."
>
> Then said the Rose, with deepening glow,
> " On me another grace bestow."
> The Spirit paused in silent thought—
> What grace was there that flower had not!
> 'Twas but a moment—o'er the Rose
> A veil of moss the Angel throws ;
> And robed in Nature's simplest weed,
> Could there a flower that Rose exceed?

The rose is essentially characterized by its pitcher-shaped, fleshy calyx, which is five-cleft and contracted at the orifice; its five petals and numerous bristly seeds attached round the inner side of the calyx. It belongs to the natural order Rosaceæ, or Rose tribe.

The Rosa Muscosa—Moss Rose—has both calyx and peduncles mossy, branches and petioles bristly and hispid; the leaflets fringed with glandular hairs. It came to us from Europe, where it is a native. It is generally three or four feet high, and its fragrance and beautiful color have made it undoubtedly the greatest favorite of the family to which it belongs. It is in bloom through the months of June and July.

To rear the Moss rose successfully, is a considerable object with our florists. Buist, a florist of considerable eminence, mentions that in this country it is a plant of very difficult culture, if not in a rich, sandy soil; but if once fairly established in a rich, deep loam, it will make shoots six feet long. Fresh soil, mixed thoroughly with manure, should be dug in about their roots during the winter of each year. Very sparing indeed must be the application of the pruning knife; too little being in all cases better than too much. Buist tells us he lost three or four hundred in a single year, by overdoing the operation. If kept in baskets four or five feet from the ground, and in an airy and rather exposed situation, they will grow admirably. The new sorts are budded on the French eglantine, and form shrubs; these require to be kept free from suckers, which arise from the roots and push upwards, and thus by drawing off the nutriment of the plant, would injure the supply required by the graft.

The Moss rose has ever been made the emblem of Perfect Joy. Milton mentions it as "without thorn the rose;" and a poet has sung the following strains to its honor in that character:—

Oh! I love the sweet blooming, the pretty Moss Rose—
'Tis the type of true pleasure and perfected joy;
Oh! I envy each insect that dares to repose
'Midst its leaves, or among its soft beauties to toy.

I love the sweet lily, so pure and so pale,
With a bosom as fair as the new-fallen snows;
Her luxuriant odors she spreads through the vale,
Yet e'en she must yield to my pretty Moss Rose.

Oh! I love the gay heart's ease and violet blue,
 The sunflower and bluebell, each floweret that blows,
The fir tree, the pine tree, acacia and yew,
 Yet e'en these must yield to my pretty Moss Rose.

Yes, I love my Moss Rose, for it ne'er had a thorn—
 'Tis the type of life's pleasures unmixed with its woes!
'Tis more gay and more bright, than the opening morn:
 Yes, all things must yield to my pretty Moss Rose.

Language of Flowers.

In the famous German *Heldenbuch*, or Book of Heroes, which is supposed to have been chiefly written by Henry von Oftendingen, the Rose Garden of Wurms holds a distinguished place. The garden was encircled by a silken thread instead of a wall, and the victorious knights who defended it against the encroachments of a party of giants were, by Princess Chrymhilde, rewarded with a chaplet of roses and a kiss. One of the knights, named Hildebrant, is described as having accepted the chaplet, but declined the salute. A monk named Ilsan, however, who was one of the triumphant warriors, not satisfied with the rewards conferred on himself, demanded a chaplet and a kiss for each of the fifty-two monks of the convent to which he belonged. It is added that Chrymhilde granted this boon, though not until Ilsan had fought and conquered fifty-two of the offending giants.

In the fourteenth and fifteenth centuries, tournaments lost much of the sanguinary character which had previously distinguished them. They became merely entertainments for the celebration of court festivals; and the combatants gained the prize of victory, not by wounds and bloodshed, but by broken lances, the fragments of which were presented to them as trophies of success. It was the etiquette of early times for a knight, on entering the lists at a tournament, to

beg permission to wear the colors of the lady to whose service he was devoted; but this practice was gradually succeeded by that of wearing about the person any pledge of love which the knight solicited from his mistress, or which the latter spontaneously presented to him. This custom of giving and wearing favors was kept up until the middle of the seventeenth century. Various changes of fashion took place with respect to the objects which were thus presented as pledges of regard; and if Bayard, the "knight without fear and without reproach," obtained from the lady of his heart a pair of elegant bracelets and a silken purse, the favored knight of a more recent age received from the hand of his mistress the less costly gift of a simple flower. The presents given in this manner by ladies to their favorite champions were soon converted into *emprises*, or devices, and were worn on those parts of the dress or armor which an adversary was obliged to touch when he challenged the possessor of the *emprise* to single combat.

In France, during the middle ages, flowers were much employed as emblems of love and gallantry. At the banquet given in celebration of the marriage of Charles the Bold, Duke of Burgundy, with the English Princess Margaret, several ingenious automata were introduced; among others was a large unicorn, bearing on his back a leopard, which held in one claw the standard of England, and in the other a daisy, the French name of which is *Marguerite*. The unicorn, having gone round all the tables, halted before the Duke, and one of the *maîtres d'hôtel*, taking the daisy from the leopard's claw, presented it, with a complimentary address, to the royal bridegroom.

In Spain, gallantry was forced to take a different direction; for there the fair sex were kept under such rigid restraint, that a lover scarcely ever had an opportunity of making a verbal declaration to his mistress. Recourse was therefore had to an expressive kind of pantomimic language, which was learned by children of both sexes at a very early

age. By this method lovers were enabled to hold communication with each other for years without ever interchanging a syllable. In the reign of Charles II., however, the Spanish ladies were allowed a greater degree of freedom; and the *Guapos*, or gallants of Madrid, who adopted the fashion of wearing flowers in their hats, used to assemble in the evening on the Prado, and to present nosegays to the ladies in their carriages.

The practice of conversing by gestures and signs was introduced by the Spaniards into Brussels, where the Duke of Orleans and the French noblemen of his suite availed themselves of this silent language to pay court to the ladies at their windows.

The Italian and Sicilian females, who were not less closely guarded than the Spanish women, also practised a pantomimic language, and adopted the use of flowers in love affairs. In Genoa, it was no unusual thing for a lady to throw a nosegay openly to her lover, and this token was received by the grateful favorite with a low bow.

Plants may in many respects be regarded as beings closely allied to man, and they frequently exercise an important influence over us. The following remarks on this subject suggested themselves to Matthisson, the German poet, while journeying along the Cosa to Domo d'Ossola: "The beautiful cyclamen, which blooms along both sides of the road, continually reminded me of the delightful summer day which I spent in company with Salis and his wife, at a shepherd's hut in the neighborhood of Malans, where for the first time I saw this flower growing wild. I have never since beheld the cyclamen without being reminded of the beloved friends with whom I first plucked and examined it, and of the smiling landscape with which we were surrounded. There are various other plants, the sight of which also revives in my mind recollections of dear and interesting persons, and which bring the scenes of early youth forcibly before me, as the strains of the *Rans des Vaches*, when heard in a foreign

country, remind the Swiss peasant of his native mountains.

"Numerous examples might be adduced to prove that, in the power of exciting past recollections, the sight of a flower has often a more magic effect than even the favorite melodies of our youth. I myself know a young lady who, though entirely free from nervous weakness, could never look at a carnation without bursting into tears, because she was plucking a flower of that kind at the moment when she was informed of her mother's death. The sight of the periwinkle always produced pleasingly painful feelings in Rousseau's mind; and Bougainville's South Sea Islander, on being taken to the Botanic Garden in Paris, knelt before an Otaheitan plant, and kissed it as fondly as he would have kissed the lips of a beloved mistress. It would be impossible to describe the many delightful ideas and recollections for which, during my solitary journeys, I have been indebted to the chronicle of Flora."

A flower-garden may be compared to a panorama of hieroglyphics, displaying, not the miserable worldly wisdom of mortals, inscribed in dead characters, but the maxims of immortal philosophy, exhibited in living forms with all their peculiar varieties. Fancy traces a symbolic resemblance between man and the forms and motions of all the natural objects in the creation; and, to borrow Chateaubriand's bold metaphor, the whole universe may be considered as the imagination of the Deity rendered visible. Yet certainly the similarity is most particularly striking in the vegetable world. The most superficial observer cannot fail to perceive that plants present faithful emblems of the various stages of human life, and the most remarkable peculiarities in our physical formation, and in our moral relations to each other.

In those southern regions, where every living being feels the influence of vital heat and the exciting oxygen which pervades the atmosphere—where the genial climate, with scarcely any change of seasons, liberally provides for the

support of man—Nature presents her vegetable hieroglyphics in the most marked and permanent characters. The contemplation of the starry canopy of heaven is calculated to inspire every reflecting mind with the sublimest ideas of immortality. When the attractions of all transitory objects are veiled in the gloom of night—when, amidst the stillness of Nature, the voice of God resounds in the rustling of the trees and the murmuring of the swelling billows—the soul seems to wing its way towards the realms of eternity, and the virtuous mind is impressed with a deeper consciousness of its moral dignity. This trait in the human mind is typified in the vegetation of the East, by a tree to which the Turks, Arabians, Persians and Malays give various names, and which we distinguish by the appellation of the Sorrowful Tree, *(Nyctanthes arbor tristis, L.)* It resembles the cherry tree in form, but it is of much larger size. Its flowers, which resemble the orange blossom, are white, with a reddish tint at the bottom of the calyx, and their perfume is like that of the evening primrose. This tree possesses the peculiar property of blooming and emitting its delightful fragrance during the night. There are

> Plants that wake when others sleep:
> Like timid jasmine buds that keep
> Their odor to themselves all day,
> But, when the sun-light dies away,
> Let the delicious secret out
> To every breeze that roams about.

The first bud of the Sorrowful Tree opens as soon as the first star appears in the heavens, and, as the shades of night advance, and the stars thickly stud the sky, the buds continue gradually blowing until the whole tree presents the appearance of one immense flower—the flower of a world compared with which our earth would be but a football. On the approach of morning, when the brilliancy of the stars gradually fades in the light of day, the Sorrowful Tree closes its flowers; and, when the first beam of the rising sun appears, not a single blossom is visible. A sheet of flower-

dust, as white as snow, covers the ground around the foot of the tree, which seems blighted and withered during the day, while, however, it is invisibly and actively preparing for its next nocturnal festival. If this tree is cut down close to the roots, a new plant shoots up and attains maturity in an almost incredibly short space of time: like the truly great man, who, though he may be for a while bowed down by the storms of fate, will soon recover, and flourish in his wonted glory. In the vicinity of this singular tree there usually grows another, which is probably a degenerate scion of the same species. In appearance it exactly resembles the Sorrowful Tree, though it is less beautiful. It blooms only in the daytime, thus presenting an emblem of those persons who seem created only to enjoy the garish light of day, and who suffer the luminaries of night to diffuse their serener radiance unheeded and unseen.

Though we dwell not on the luxuriant banks of the Tigris, where, in the spring, the whole country exhibits the appearance of a richly variegated and perfumed flower-bed, yet even in the less fertile regions of the North the gifts of Flora are sufficiently abundant and diversified to enable us to create from them a language for the expression of those sentiments to which the tongue cannot always venture to give utterance. Every flower seems naturally to present some particular emblematic meaning; and, in the combination of a garland or nosegay, it is no difficult matter to compose a riddle, the solution of which may afford an agreeable exercise to the fancy.

If, for example, a lady should receive from her lover a boquet consisting of roses, lilies, laurel and forget-me-not, the meaning of the present might be thus interpreted: the flower of innocence, when kissed by the rose, blushes as thou wouldst blush at the approach of love; the proud laurel denotes thy beauty's triumph; and the tender forget-me-not is the emblem of eternal constancy.

This idea of rendering flowers the vehicle of a lover's sentiments has been thus happily seized by the poets:—

"Aske me why I send you here
This firstling of the infant year;
Aske me why I send to you
This primrose, all bepearl'd with dew:
I strait will whisper in your ears,
The sweets of love are washt with teares.

"Aske me why this flower doth show
So yellow, green and sickly too;
Aske me why the stalk is weak,
And bending, yet it doth not break:
I must tell you, these discover
What doubts and fears are in a lover."

Here damask roses, white and red,
Out of my lap first take I,
Which still shall run along the thread:
My chiefest flower this make I.

Amongst these roses in a row,
Next place I pinks in plenty,
These double pansies then for show;
And will not this be dainty?

The pretty pansy then I'll tye
Like stones some chain inchasing
And next to them, their near ally,
The purple violet placing.

The curious, choice, clove Julyflower,
Whose kind hight the carnation,
For sweetness of most sovereign power,
Shall help my wreath to fashion;

Whose sundry colors of one kind,
First from one root derived,
Them in their several suits I'll bind,
My garland so contrived.

A course of cowslips then I'll stick,
And here and there (though sparely)
The pleasant primrose down I'll prick,
Like pearls that will show rarely.

Then with these marigolds I'll make
My garland somewhat swelling;
These honeysuckles then I'll take,
Whose sweets shall help their smelling.

The lily and the fleur-de-lis,
For color much contending,
For that I them do only prize,
They are but poor in scenting.

The daffodil most dainty is,
  To match with these in meetness;
The columbine compared to this,
  All much alike for sweetness.

These in their natures only are
  Fit to emboss the border,
Therefore I'll take especial care
  To place them in their order

Sweet-williams, campions, sops-in-wine,
  One by another neatly:
Thus have I made this wreath of mine,
  And finished it featly. DRAYTON.

Medical Department.

ORANGE.—The flowers, leaves, yellow rind and juice are all used for medicinal purposes. The *flowers* are highly odoriferous, and much used as perfume. To the taste they are bitter. Both water and spirit will extract the taste and odor, though rectified spirit for this purpose is the best. From the distillation of the flowers Oil of Neroli is obtained, an article much used in the finer kinds of Cologne. They were at one time said to be a very useful article in convulsions and epilepsey, but experience has not confirmed the virtues expected of them.

The *leaves* have a bitterish taste. They yield by distillation an essential oil. They have been applied for the same purposes as the flowers, and with the same unsuccessful result in the majority of cases, though there are a few exceptions.

The yellow rind, or *peel*, when freed from the white part, has a grateful aromatic flavor, and a warm, bitterish taste. Infused in boiling water, it gives out nearly all its smell and taste; but it must not be subjected to long boiling, as that would evaporate its volatile principles. Cold water will extract the bitter, but very little of the flavor. By distillation the Oil of Orange is obtained. The aromatic and bitter proper-

ties of the peel have caused its employment in restoring the tone of the stomach, and make it a common addition to dyspeptic bitters. It has been powdered and given in intermittents, in doses of sixty grains, three times a day. Large quantities have at times caused considerable mischief, more especially in children, in whom it has produced convulsions; and we have on record the case of a child who was killed by eating the rind of an orange.

The *juice* is a grateful acid, proving extremely useful in fevers, and diseases not complicated with intestinal irritation. We are told, that it is particularly serviceable in scurvy, which disease it will alone prevent or cure in the most apparently desperate cases, deriving this property, most probably, from the citric acid it contains.

Aqua Aurantii Corticis—Water of Orange-Peel.—Take of fresh orange-peel *two pounds;* water *five quarts;* distil one gallon, and add half a gill of alcohol. This is but little used. One or two ounces is a dose.

Aqua Aurantii Florum—Orange-flower Water—Take of orange-flowers *ten pounds;* alcohol *two gills;* water *two gallons;* distil a gallon. Used in perfumery.

The Confection of Orange-peel is prepared by gradually mixing three pounds of refined sugar with a pound of fresh peel, which has been separated from its inside pulp by grating. In London they are beat together in a stone mortar. This is generally used as a vehicle for exhibiting powders.

The Compound Infusion of Orange-peel, by pouring a pint of boiling water on half an ounce of dried orange-peel, two drams of fresh lemon-peel, and a dram or eighth of an ounce of bruised cloves, allowing it to stand some twenty minutes and straining. A wine-glass of this makes a grateful stomachic.

The Syrup of Orange-peel is made by pouring a pint of boiling water on two ounces of the bruised peel, allowing it to remain twelve hours before straining, and then formed a syrup by gradually dissolving it in two pounds and a half

of white sugar, over a slow fire. Its pleasant flavor is the only cause of its employment.

As the rind of the Seville orange is more bitter than the common sweet variety, it should be preferred when used as a tonic; and the sweet, when flavor is the object required.

Lemons are principally celebrated for the *juice*, which consists chiefly of citric acid and gummy matter. This juice is considered a specific for the cure of scurvy, and no ship setting out on a long voyage is thought properly provided, without a quantity of concentrated lemon-juice, or citric acid, (acid of lemons.) When the latter is used, it should be prepared by dissolving an ounce of citric acid in a pint of water, and adding five drops of the oil of lemons. Some persons concentrate the juice by exposing it to a degree of cold sufficient to congeal the watery and gummy parts. After a crust of ice is formed, the juice is poured into another vessel; and by repeating this process several times, the remaining juice has been concentrated to eight times its original strength, and kept without suffering any material change for several years. Others consider the most effectual method of retaining both flavor and purity, (the frozen loses its flavor,) is to express the juice, and allow it to stand till a coagulable matter separates, which it generally does in a short time, and then pour it into glass bottles, leaving room enough between the juice and the cork for a stratum of almond or sweet oil—a preventive against decomposition, by preventing access to the atmosphere. A gentle heat will also, if continued some time, evaporate the juice. When used, it is diluted with enough water to reduce it to its former strength.

Citric Acid is not peculiar to the orange genus; it may also be found in the cranberry, bittersweet, gooseberry, currant, strawberry, and many others. It is made in great quantities in the United States, from the expressed juice, purposely imported from Cuba, and other West India islands. The juice thus obtained is boiled, and while still hot, is saturated with powdered chalk. The citric acid immediately leaves

its old combinations and unites with the chalk, forming, in the language of chemistry, a salt. This salt is but little, if at all soluble in the water, and being heavier than the water or the gummy and extractive substances it was formerly mixed with, it falls to the bottom, a precipitate of citrate of lime. Now that the acid has been coaxed out of the lemon by an alkali, we want, as we require the acid alone, to get rid of the coaxer. This is done by in turn saturating it with sulphuric acid, diluted with ten parts water, boiling the salt and acid for a few minutes until thoroughly incorporated. It is now cooled and filtered. The sulphate of lime remains on the filter, and the liquor affords a crystallized acid at the bottom by evaporation. It is white in color, permanent in the air, and in the form of rhomboidal prisms with dihedral summits. Its specific gravity is 1.6. Its taste is powerfully acid, mixed with a slight caustic. It will dissolve in its own water of crystallization when heated, decomposes at a high temperature, becoming brown or yellow, the liquid syrupy matter retaining its sour taste, but not its crystallizable quality.

The Effervescing Draught, or Neutral Mixture, is made by dissolving fifteen grains of carbonate of potassa in half a fluid ounce of water, and pouring this solution into a cup containing a fluid ounce of water and lemon-juice in equal parts. This mixture is drunk while effervescing.

The exterior rind of the lemon is a very grateful aromatic bitter, not so hot as orange-peel, and yields in distillation a less quantity of oil, which is extremly light and almost colorless; though less warm, it is similar in its qualities to orange-peel, and employed with the same intentions. The juice has been employed with success to stop vomiting, and been found useful also, in combination with opium and Peruvian bark, in intermittents.

Lemon Syrup is made by dissolving two pounds of refined sugar in a pint of strained lemon-juice, over a slow fire. Its properties and uses are too well known to need mention here.

Introductory Department.

We will now enter upon the physiology of *flowering* plants, taking the whole subject, however, in review, and introducing the *flowerless* in their connection. We intend to make this portion also serve the purpose of a glossary, so that the first volume will be complete within itself. Having thus finished the physiology of plants, and given the details of the Linnean system, we will hereafter consider the Natural system in connection with the text, and in future dispense with an introductory department, enabling us to give six flower plates in consequence.

Nearly six thousand years ago, on the third day of Creation, God made every plant of the field, *before* it was in the earth, and every herb of the field, *before* it grew. By that time the various mechanical and chemical forces were in operation, and all things prepared for the advent of life, which was thus created in its simplest form. The earth brought forth GRASS, and the HERB YIELDING SEED, and the FRUIT-TREE YIELDING FRUIT, after its kind, WHOSE SEED WAS IN ITSELF. The surface of the ground was covered, in the first place, with the moss tribes and those different kinds of plants that are destitute of flowers, springing up apparently without the aid of either seeds or roots. Mosses, Lindley remarks, are usually the first plants that show themselves on rocks or walls, and barren places, where no other vegetation can establish itself; provided the air is damp, they will flourish there, and in time lay the foundation of a bed of vegetable mould, in which the roots of *grasses and other stronger plants may find support, till they in their turn have decayed and prepared the way for shrubs and trees.* This is the order observed by nature in converting naked surfaces into vegetable mould; and we now see this harmony was not disturbed even at the commencement. The wheat, barley and grass

tribes succeeded the mosses in natural rotation, with their seeds so prominently displayed as to name them herbs yielding seed; and these were followed by the fruit-tree yielding fruit after its kind, whose seed was in itself; applying with singular accuracy to our larger vegetables and fruit-bearing trees; and we are thus presented with the remarkable fact, that the three grand divisions of the vegetable kingdom made by Moses, not only bear an analogy to the most improved Natural system of the present day, but that the two in their grand outlines are absolutely identical; a perfect confirmation of all which is shown in the layers of strata: ACOTYLEDONES are always found deepest; MONOCOTYLEDONES next; and DICOTYLEDONES uppermost, and last.

Though we are thus informed of the creation of the vital principles of vegetables, nothing is said relative to the mode of their union with matter; but presuming the account of man's formation a type of the rest, we suppose the dust was formed into the likeness of each plant, and the breathing of the breath of life gave it a material existence. This life-power in vegetables has four modifications: IRRITABILITY, the power of acting or being acted upon, the main spring, in fact, by which all the rest are set in motion; MOBILITY, the power by which the sap ascends; VITAL AFFINITY, the power of uniting the elementary atoms; and VIVIFICATION, the power of imparting life, as in vitalizing the food. Besides the soul and matter, man possesses a life-principle, which differs from that of plants in having two more modifications; these are SYMPATHY and SENSIBILITY, for the manifestation of which the nervous system is indispensable. Not understanding these distinctions, and perceiving that nutrition and secretion were carried on in plants very much as they were in animals, the ancient Greek philosophers asserted that not only were these functions the same in both, but, as they could not fix any limits, proceeded to declare plants possessed of sensible and rational souls, and capable of desires and fears, pleasures and pains. In our own times,

from ignorance of the laws of life, there have not been wanting those who consider plants in possession of a concealed nervous system, and consequently endowed with sensibility; but all such suppositions are obviously erroneous, the phenomena that led to them being explainable in a more simple and rational manner.

Plants are of three sorts: TREES, 1, SHRUBS, 2, and HERBS, 3.* These last are called *annual*, when they spring from seed, and expend all the nourishment they acquire in the production of flowers and fruit, perishing directly afterwards: such are most of the common garden flowers, peas, beans and cucumbers: *biennial*, when they spend the first season elaborating material, and the ensuing year consume it the same way as in the first, likewise perishing: such are onions, beets and carrots: these plants owe their peculiar forms to the accumulation of nourishment which is stored up in them: we wait until they have thus laid up a store, and then seize it for our own purposes, treating it like a vegetable hive, the roots being as full of nutriment as the hive is of honey; *perennial*, where the capital is not exhausted, the plant living on the interest, all of which it does not even spend, but increases every year: such are dahlias, orchises, trees and shrubs. They all possess ROOTS, STEMS, LEAVES and SEEDS.

The ROOT is the descending axis, the organ by which the plant is fixed, and by means of which it receives nourishment. There are several kinds of these: *spindle-shaped*, or fusiform, as those of the carrot and radish, 4; *branching*, or ramose, as in trees, 5; *bulbous*, of which some are solid, as the turnip, 6, some scaly, as the lily, 7, others coated, as the onion, 8; *tuberous*, (having fibres on the sides and top,) round and fleshy, as the potato, 9, and peony, 10; *fibrous*, consisting of slender threads, as in the grasses, 11; *granulous*, having numerous

* This is the mode in which the older botanists used to divide the vegetable kingdom: trees, as the oak, taking the first rank; shrubs or small trees, as the lilac, next; and thirdly, herbs, as the peony and dahlia, those that die down to the ground every year.

beads mixed with the fibres, as in the white saxifrage, 12; *repent*, or creeping, as in mint, 13; *premorse*, or bitten off, as in devil's bit scabious, 14.

The ascending axis, or STEM, is that part which produces and supports the leaves or fructification, or both; in its growth it is *upright*, erectus, as in yellow centaury, 15; *straight*, as in garden lilies; *procumbent*, resting on the ground, as in the cucumber, 16; *repent*, or creeping, as in crowfoot, 17; *sarmentose*, or trailing, as in the strawberry, 18; *radicant*, clinging, as the ivy, 19; *scandent*, or climbing, as the vine; *turning*, ascending round other plants, as the hop, 20; *diffuse*, loosely spreading, as in stone-crop; *flexuous*, or zigzag, as in matted lavender, 21; *forked*, or dichomatous, as in mistletoe, 22; *proliferous*, shooting new branches from the summits of former ones, as in some pinks; *articulate*, or jointed, as in marsh samphire, 23.

In shape—*round; two edged*, 24; *triangular; square; angular*, where the number is more than five; *winged*, 25. The surface is—*smooth; smooth* and *even; polished; viscid; scabrous*, rough; *hispid*, bristly, hairy; *downy; villous*, shaggy; *houry; glaucus*, clothed with a sea-green mealiness, which easily rubs off; *striated*, marked with fine hollow parallel lines; *furrowed; spotted.*

A CULM, or straw, is the peculiar stem of grasses, rushes, and other similar plants: they are—*without joints; jointed*, or *knee-bent.*

A SCAPE, or stalk, rises from the root, supporting the flowers and not the leaves, as in the narcissus, primrose and hyacinth; differing only in respect to origin from the *peduncle*, which springs from the stem, to perform a similar office. This last is *axillary*, when it grows from the angle formed by the leaf and stem, 26; *opposite*, when opposed on the other side by a leaf, 27; *gemmaceous*, growing out of a leaf-bud, 28; *terminal*, ending a branch; *lateral*, on the side of a stem, 29; *solitary*, only one; *clustered*, several growing together; *scattered*, irregularly dispersed; *sessile*, without a flowerstalk.

The PETIOLE, or leafstalk, supports the leaf, but not the flowers.

A FROND is composed of a branch and leaves blended together, and is frequently united with the fructification, 30; its stem is called a STIPE, *a*, which term is also applied to the stalk of a fungus, 31 *a*.

A LEAF is merely a contrivance for increasing the surface of a plant, so as to expose the greatest amount of CHLOROPHYLLE to the influence of the light and air: this chlorophylle, or green coloring matter, is the peculiar agent that performs the function of respiration in plants. An expansion of bark is pushed outwards and spread into a thin plate, which is stiffened by woody fibres; this is called a leaf. When the plant does not require a very extensive apparatus for respiring, there are few or no leaves, the green matter being spread upon the stem, which of course performs this function: such is the case in the dodder and cactus. When exposed to the air in a horizontal position, their under-surface is full of pores, the number of which varies in the different species from 300 pores to 150,000, sometimes even more. The upper surface has but a few pores in comparison with the lower; it is smooth and shining, serving as a roof. Leaves are of all sizes, from those which require the lens of a microscope to obtain a true sight, as in many of the mosses, to the talipot tree of Ceylon, twenty feet long and fifteen feet broad. No proportion appears to be between the size of the leaf and the tree to which it belongs: an oak leaf is not one sixth as large as one from the burdock; but *number* in many instances, no doubt, compensates for *diminutive size.*

Leaves are SIMPLE, COMPOUND and DETERMINATE. SIMPLE LEAVES are such as have only a single leaf on a petiole, or footstalk, no matter how this may be cut or incised. They are named from their shape and appearance: *orbiculate*, or round, 32; *subrotund*, nearly circular, 33; *ovate*, egg-shaped, 34; *obovate*, ovate reversed, 35; *oval*, 36; *oblong; lanceolate*, spear-shaped, 37; *spatulate*, roundish, tapering into an oblong

base, 38; *cuneiform*, wedge-shaped, 39; *linear*, strap-shaped, 40; *subulate*, awl-shaped, 41; *acicular*, needle-shaped, 42; *reniform*, kidney-shaped, 43; *cordate*, heart-shaped, 44; *lunulate*, crescent-shaped, 45; *triangular*, 46; *deltoid*, trowel-shaped, 47; *sagittate*, arrow-shaped, 48; *hastate*, halbert-shaped, 49; *rhomboid*, diamond-shaped, 50; *lobed*, when divided to the middle into parts, that stand wide from each other, and are rounded or convex at the margin: according to the number, they are—*bilobate*, or two-lobed; *trilobate*, or three-lobed, 51; *quadrilobate*, or four-lobed; *quinquelobate*, or five-lobed, 52: *quadrangular*, or four-angled, 53; *quinquangular*, or five-angled, 54; *panduriform*, fiddle-shaped, 55; *lyrate*, lyre-shaped, 56; *runcinate*, cut in transverse acute segments, pointing backward, 57; *palmate*, hand-shaped, 58; *pinnatifid*, or wing-cleft, 59; *bi-pinnatifid*, doubly wing-cleft, 60; *pectinate*, when a pinnatifid leaf has remarkably parallel and narrow segments, like the teeth of a comb, 61; *laciniate*, jagged, 62; *partite*, divided when separated nearly to the base, 63: such are *bipartite*, in two parts, *tripartite*, in three parts, &c.: *sinuate*, edges hollowed or deeply scolloped, 64; *oblique*, unequal, 65; *truncate*, abrupt, as in the tulip tree; *premorse*, jagged or irregularly notched, 66; *retuse*, ending in a broad shallow notch, 67; *emarginate*, notched at the extremity, 68; *obtuse*, blunt, as in the daisy; *acute*, or sharp; *acuminate*, or pointed; *mucronate*, sharp at the point, and tipped with a rigid spine, as in thistles; *cirrose*, or tipped with a tendril; *entire*, as in the lily tribe; *serrated*, edged like a saw, 69; *doubly serrated*, when the teeth are again cut into other little teeth, 70; *crenate*, or scollopped, 71; *dentate*, or toothed, 72; *spinous*, prickly, 73: opposed to this, *unarmed; wavy*, when the border is cut alternately into minute angles and segments of circles, 74; *glandular*, beset with numerous little glands; *revolute*, when the margin is rolled backward: the reverse of this is *involute: ciliate*, or bordered with a fringe of hairs; *veiny*, when the fibres on the surface are branched; *curled*, 75; *rugose*, wrinkled, as in sage; *plaited*, 76; *undulate*, obtusely

waved, 77 ; *costate*, ribbed, 78 ; *naked*, without clothing of down or hair ; *ensiform*, sword-shaped, 79 ; *acinaciform*, scymitar-shaped ; *dolabriform*, hatchet-shaped, 80 ; *semi-cylindrical*, flat on one side and rounded on the other ; *tubular*, hollow within, as in the onion ; *fleshy*, as in the aloe and houseleek ; *gibbous*, swelling on one or both sides ; *canaliculate*, channelled, 81 ; *three-edged*, three sides and three angles, 82 ; *carinate*, or keeled, 83 ; *sulcate*, furrowed ; *cylindrical ; lingulate*, tongue-shaped.

COMPOUND LEAVES are such as have more than one leai upon a petiole or leafstalk. These are—*binate*, growing in pairs, 84 ; *ternate*, growing by threes, 85 ; *quinate*, growing in fives, 86 ; *digitate*, or fingered, when several leaflets proceed from the summit of a common stalk ; *pinnate*, or winged, when on opposite sides of one footstalk, as in the ash tree and rose : these are—*pinnate, terminated by an odd one*, 87 ; *abruptly pinnate*, without an odd one, 88 ; *oppositely pinnate*, when in regular pairs ; *alternately pinnate*, 89 ; *pinnate, terminated by a tendril*, 90 ; *decursively pinnate*, when little leaves expand downward along the stalk, on each side, 91 : *interruptedly pinnate*, when there is a regular alternation, with smaller leaves, 92 ; *bipinnate*, doubly winged, 93 : *biternate*, doubly three-leaved, 94 ; *triternate*, triply three-leaved, 95 ; *pedate*, like a bird's foot, 96 ; *articulate*, jointed, one growing from another, 97.

DETERMINATE LEAVES. By this is to be understood, their character expressed from some circumstance foreign to their own particular structure or shape ; as from their situation, insertion or direction. These leaves are—*inflected*, or curved inward ; *erect*, upright, 98 ; *expanding*, spreading between upright and horizontal, 99 ; *horizontal*, at right-angles with the stem, 100 ; *reclined*, or reflex, bent downward so that the tip is lower than the base, 101 ; *radical*, springing directly from the root, as the cowslip ; *depressed*, where the radical leaves are pressed close to the ground, as in hoary plantain ; *natant*, floating on the surface of the water, as in water lilies ;

demersed, plunged under the water; *emersed*, growing partly above the water; *seminal*, or seed-leaves, those which rise immediately from a seed, or rather, which before were the cotyledones, 102; *cauline*, or stem-leaves, growing from the stem; *ramose*, or branch-leaves, growing from the branches; *peltate*, or shield-form, when the footstalk is inserted at or near the centre of the lower surface, 103; *petiolate*, having a footstalk, as the common gooseberry or currant; *sessile*, or sitting, attached without a footstalk, 104; *decurrent*, running downwards, when the base of a sessile leaf extends downwards along the stem, 105; *amplexicaul*, embracing the stem, 106; *semi-amplexicaul*, when only half clasping it; *perfoliate*, when one base of the leaf meets the other behind, and both grow together, giving the appearance of the stem perforating it, 107: when two leaves join at their bases in this way, it is called *connate; vaginant*, or sheathing, when the base of a leaf enfolds a stem, and there forms a cylindrical tube, as in the grasses, 108; *equitant*, disposed in two opposite rows and clasping each other by their common base, 109; *stellate*, or starry; *verticillate*, or whorled, when the stalk is surrounded by leaves, like the spokes of a wheel, 110: these, according to their number, are—*bine*, when two, *tern*, when three, *quatern*, when four, &c.; *opposite*, when the leaves grow in pairs opposed to each other, 111; *alternate*, when the leaves grow out regularly one above another, on the opposite sides of the stem, 112; *acerose*, when needle-shaped, linear and evergreen, as in the fir and yew; *imbricated*, or tiled, when they lie over each other, like the tiles of a house; *fasciculated*, when many arise nearly from the same point, as in the larch; *decussate*, in pairs alternately crossing each other, as in mint; *two-ranked*, spreading in two directions, yet not regularly opposite at their insertion, as in the yew.

Leafstalks sometimes undergo singular modifications, changing into pitcher-shaped and bottle-like bodies, as in the pitcher-plant and side-saddle flower, and at others into tendrils, or claspers, which are spiral shoots or strings, by means

of which plants are enabled to support themselves upon other objects, as in the vine and pea, 90 a.

A STIPULE is an appendage at the base of a leaf, either *membranous*, *leathery* or *spiny*. They are sometimes on each side, and sometimes on one side only of the base of the leaf-stalks, for the purpose, many think, of supporting them at their first appearance, 115 a. When leaves are furnished with them, they are said to be *stipulate;* when wanting them, *ex-stipulate.* Lindley thinks these bodies are really accessory leaves, as they are often transformed into them, often undistinguishable from them, of which they obviously perform all the functions, and finally, there are cases in which buds develop in their axilla—a property peculiar to leaves and their modifications.

BRACTEÆ, or floral leaves, differ in shape and color from the other parts of the plant. Between them and common leaves there is in reality no exact limits, but in general they may be known by their situation immediately below the calyx, by their smaller size, difference of outline and color. They have few of the regular organs of the flower, and produce neither fruit or seed. The hydrangea has a great abundance of pink and lilac bracteæ, which are often supposed to be its blossoms. The lime tree also shoots out a profusion of them, of a pale yellow color, most generally confounded with the true blossom that lies underneath, 116.

SPINES, or thorns, are imperfectly developed branches, contracting into a sharp-pointed projection, connecting, of course, with the woody substance. Sometimes they bear leaves, and at others often, by cultivation, disappear entirely, as in the apple and the pear, 116.

ACULEI, or prickles, are sharp-pointed projections formed from the bark, and like it made up of cellular tissue. They have been considered compound indurated hairs. Having no connection with the woody fibre, they are obviously distinguished from spines, and are found upon all parts of the plant except the stipulæ and stamens, 118.

All the unconnected technical terms describing leaves, formed an arbitrary nomenclature, severely tasking the student and needlessly confusing the science, till the time of De Candolle, who reduced the whole into a clear and consistent system, based on true philosophy, and easily applied. The German poet Goethe propounded this same theory in his immortal work, the Metamorphoses of Plants, in 1790; but his book was refused without hesitation, as the wonders it revealed were considered merely the romance of a poet; yet, strange to say, what was universally rejected fifty years ago, is now universally acknowledged as indisputable truth. His idea with regard to leaves was, that the almost innumerable varieties, in form and outline, might be deduced from the different ways and degrees in which the woody skeleton, or frame-work, was ramified in the parenchyma, or cellular substance; an obvious truth, the simple annunciation of which, to an unprejudiced mind, calls forth a decided assent.

Vegetables, like animals, are covered externally by a thin membrane, or SKIN. In this are openings called STOMATA, connected with respiration. It is often covered with HAIRS, or down, which are transparent, sharp processes of cellular tissue.

The FRUCTIFICATION of a plant comprises both the flower and fruit, and all the parts which are immediately necessary for the production and preservation of these. It comprises seven principal parts: CALYX, COROLLA, STAMENS, PISTIL, SEED-VESSEL, SEED and RECEPTACLE.

The CALYX, or flower-cup, is defined as the most exterior covering of the flower, consisting of several verticillate leaves, either united by their margins or distinct, usually of a green color and more rude and less delicate texture than the corolla. Lindley thinks the only just mode of distinguishing the calyx seems to be, to consider it in all cases the most exterior verticillate series of the integuments of the flower, within the floral leaves, whether it be half colored, deciduous and of many pieces, membranous and wholly col-

ored, or green and bell-shaped. Upon this principle, where there is only one series of floral integuments, that series is the calyx. A calyx, therefore, can exist without a corolla; but a corolla cannot exist without a calyx. Its divisions are called SEPALS. Sometimes it invests the stamens and not the germen, 120; at others the germen and not the stamens, 121; mostly, however, it invests both, 122.

INVOLUCRUM, or fence, is the calyx of an umbel when stationed at some distance from the flower, as in fennel, 123. It is a *universal involucrum*, if it be under the universal umbel, 123 *a*; and *partial involucrum*, if under the partial umbel, 123 *b*.

AMENTUM, or catkin, is a composition of flowers and chaff on a long, slender, thread-shaped receptacle; the whole resembling a cat's tail in shape, whence the common name. The flowers in this case are on a spike, and destitute of calyx and corolla, the place of which is taken by bracteæ: when it falls, all comes off in a single piece, 124.

SPATHA, or sheath, is a modified leaf or bractea, opening lengthwise and surrounding a spadix, 125. Such is also the nature of the GLUME or husk of grasses, consisting of one or more thin, dry, transparent leaves, called valves, 126. The sharp points, or beards, issuing from the glume, are called awns, or aristæ: they form excellent hygrometers, 126 *a*.

PERICHOETIAL LEAVES form the scaly sheath that invests the base of the fruit-stalk in some mosses, 127. The VOLVA, or wrapper, is an involucrum like the base of the stipes ot mushrooms and some other kinds of fungi. It surrounds the stem, and while the plant is in a young state is attached to the upper part, or cap. When torn by the growth of the cap, the part surrounding the stem remains, and in this state is called the ring, 128 *a*; the curtain, *b*, the cap.

The CALYX is sometimes *single*, 119, and at others *double*, 129; *imbricate*, or composed of various scales lying over each other, 130; *squarrose*, composed of scales spreading widely open, 131; *augmented*, having a series of distinct

leaves shorter than its own, surrounding the outer part of the base, 132; *many-flowered*, as in the class syngenesia; if beneath the seed-vessel, it is *inferior*, 133; if above it, *superior*, 134. The margin may be *entire*, *serrate*, or sawed at the edge, and *ciliate*, or fringed with hairs. With respect to its apex, it may be *acute*, *prickly*, *obtuse* and *lopped*. With respect to duration—*caducous*, falling off at the opening of the flower, as in the poppy; *deciduous*, falling off with the corolla; *persistent*, when it continues until the fruit arrives at maturity. It is many times difficult to distinguish the calyx from the bractea, or floral leaf, until the former begins to wither, which it always does when the fruit is ripe; but the floral leaf continues for some time afterwards.

The COROLLA is that envelop of the flower which forms the second whorl within the calyx, between it and the stamens. Its divisions always, without exception, alternate with those of the calyx, and are called petals. Like the sepals, they are either united by their margins, or distinct; but unlike the calyx, they are rarely green, being for the most part either white or of some color, such as red, blue or yellow, or any of the hues produced by their intermixture; it is also generally much larger than the calyx. When *monopetalous*, it usually consists of two parts, a tube, or lower part, 135 *a*, and limb, or upper part, which usually spreads wider; *bell-shaped*, or campanulate, bulging out without a tube, 136; *funnel-shaped*, or infundibuliform, 137; *salver-shaped*, hypocrateriform, 135; *wheel-shaped*, rotate and flat, 138; *gaping*, or ringent, 139; *personate*, two lips closed by a kind of palate, 140; *dipetalous*, consisting of two petals; *polypetalous*, consisting of many petals, each with a claw or narrow part, usually, by which it is fixed, and a lamina, or thin plate, which is the upper part: these are—*cross-shaped*, or cruciform, consisting of four equal petals, making an equal-sided cross, 140; *butterfly-shaped*, or papilionaceous, irregular, consisting of four petals, somewhat resembling a butterfly in shape. The back or upper one is large and spreading, and

has the name of standard, 141 *a;* the two side ones are called wings, *b;* and the lower has the name of keel, from an imaginary resemblance in form to the keel of a ship, *c*. These parts may be studied with advantage in the pea, which resembles, when in bloom, a butterfly so much as to make a poet describe it as

> "Sweet peas on tiptoe for a flight,
> With wings of gentle flush o'er delicate white."

The NECTARY, or honey-cup, is for the secretion of honey; the use of which, some say, is to tempt insects, that by their contact they may carry the pollen from one plant to another; and others, that it is only for the nourishment of the stamens: it is probably useful in both ways. It is very various in form and appearance: in plants of one petal, the tube generally contains the honey, 119 *a;* in the columbine, a kind of spur, 143; in the crown-imperial, a hollow cavity in the substance of the petals, 144; in the narcissus, crowning the corolla like a funnel, 145; in the lily, a naked channel, 145; in cypripedium, resembling a slipper, 146: like a bee in one kind of ophrys, 147; and in another, like a man hanging by the head, 148; singularly beautiful in the grass of Parnassus, where, springing from the base of each petal, is a heart-shaped substance terminating in thirteen slender threads, each tipped with a little globe, 149: it has been compared, in the aconite, to a dolphin elevated on a pillar, 150.

The next row inside the petals are called STAMENS. They surround the pistils. They are composed of a *filament*, or thread, 151 *a*, and cap on its summit, the *anther*, *b*. Their office is to secrete the *pollen*, or farina, a fine dust elaborated by the anthers, which is of different shapes and colors, too minute to be examined without the microscope. These are the male parts of the flower, and their name, *andri*, is derived from the Greek, signifying husband. The system, taken collectively, is termed ANDRÆCIUM.

The last organ to enumerate is the PISTILLUM. In all

cases it occupies the centre of the flower, terminating the axis of growth of the peduncle, and is consequently the part, without exception, around which every other organ is arranged. Taken collectively, the female system is called GYNŒCIUM. It consists generally of three parts: the *germen*, or seed-bud, which is the lower part, and is the rudiment of a seed-vessel or fruit not yet arrived at maturity, 153 *a;* the *style*, or shaft, standing on the germen and supporting the summit, not absolutely essential, 153 *b;* the *stigma*, or mounting of the style, which is varying in shape and number, 153 *c:* it is destitute of cuticle, and consequently always moist. At the proper season the pollen is thrown upon the surface of the stigma: it produces a subtle impression on the vital powers of the part, which occasions a strangely vivifying series of consequences, that eventually terminate in the production of fruit.

The SEED-VESSEL, or pericarp, is the germen grown to maturity, and is that organ of a plant that contains the seeds, 154. The name pericarp is derived from two Greek words, περί, around, and καρπός, fruit. In botanical acceptation, it should be remembered that the seed and its coverings always constitute the fruit. There are several kinds of FRUIT. A CAPSULE is a dry, hollow seed-vessel, opening in a determinate manner, at the side, horizontally, lengthways, or at the top: its parts are—a *valve*, or inclosure, which is the general covering, 154 *a;* *sutures*, or seams, the edges by which the valves are connected, 154 *b;* *cells*, or loculaments, hollow places in which the seeds are situated: some capsules have only one, others two, three, four, &c., 154 *c;* *partitions*, or dissepiments, which separate the cells from each other, 154 *d;* the *column*, an upright substance, that passes through the centre of some capsules, and connects the several partitions and seeds, 154 *e*. A NUT is a seed covered by a hard woody shell, 155. A DRUPE is a pulpy seed-vessel, consisting of a hard stone or nut, sometimes encompassed by a fibrous substance, as in the almond, and at others by a

fleshy tissue, as in the peach, 156. A BERRY is a pulpy seed-vessel, in which the seeds are naked and dispersed, as in the gooseberry, 157, strawberry, 158. A POME is a fleshy or pulpy seed-vessel inclosing a capsule, which contains the seeds, as in the apple, 159. SILIQUE is a pod or seed-vessel, usually longer than it is broad, with two valves or covers, and separated by a linear receptacle, the seeds alternately fixed to both sutures or seams, 160 : when this is broad and short, it is called a SILICLE, 161. A LEGUME is a pod or seed-vessel of two valves, in which the seeds are fastened to one suture or seam only, as in the pea, 162. A CONE, or STROBILE, is a kind of seed-vessel formed by a catkin with hardened scales, and containing a seed within the base of each scale, as in the fir, 163. A FOLLICLE is a fruit formed by a single carpel or covering, as in the columbine. An ACHENIUM is a small and dry seed-vessel containing one seed : the fruits are simply seed-like, and by the earlier botanists were considered naked : its name is also applied to one-seeded fruits, resulting from a one-celled ovary, when formed of more than one carpel and invested by the calyx tube, as in the sunflower. A CREMOCARP consists of a pair of achenia, placed opposite each other and invested by the calyx tube. A CARYOPSIS is thin and membranous, like an achenium, but adheres to the surface of the seed, from whose proper covering it is inseparable, as in the grasses. A UTRICLE is the same as the former without its adhesive properties, as in chenopodium. A SAMARA is the name of a nut or achenium, which has a winged margin, as in birch and elm. A PYXIS is a capsule opening transversely.

The SEED is the little embryo in a mature state, provided with its proper coverings. It has an outer covering called a seed-coat, or ARIL ; the EYE, or hilum, 164 *c*, is the scar which is left after the separation of the vessel that conveyed the nourishment to the seed, from the seed-vessel. The little embryo, or future plant in miniature, 164 *a*, is provided with a store of nourishment to subsist upon while germinating,

before its roots are enabled to absorb the elementary atoms from the soil: this is analogous to the yolk of the egg, left in the stomach of the young chick. The nutritive matter is imbedded in the folds of one or more leaves, which, from the cavities they thus afford, are called cotyledones: these are always the first to rise above the surface of the ground, which they do to subserve the purposes of respiration to the young plant, and immediately wither and die when their charge can take care of itself, 164 *b*: as their number seldom varies in plants of the same family, it has been assumed by some as a basis of classification. ACOTYLEDONES are those plants that have no seed-lobes or leaves, as the mosses. MONOCOTYLEDONES are those plants that have one seed-lobe or leaf, as the grasses. DICOTYLEDONES are those plants that have two seed-lobes or leaves, as the beans. POLYCOTYLEDONES are those plants that have many seed-lobes or leaves, as the pines.

This provision for the young plant forms, as will easily be perceived from what we have observed, the nutritive matter of wheat, beans, peas, &c.: when we use this for our own purposes, we differ only in the case of robbing the bee of its winter's store of honey, by remorselessly consuming both the embryo and its food. Some seeds are crowned with the cup of the flower; others have a hairy or feathery crown; others, again, a thread at the extremity; others are covered with hooks; and others have a kind of membrane attached to them, for the purpose of enabling the wind to waft or disperse them abroad. They vary exceedingly in figure: some are *kidney-shaped*, as in the poppy; others *globular*, as in the pea; others *triangular*, as in those of the tansy; and others, again, *cylindrical*, as those of St. John's wort.

"Lo! on each seed, within its slender rind,
Life's golden threads in endless circles wind;
Maze within maze, the lucid webs are rolled,
And as they burst, the living flame unfold.
The pulpy acorn, ere it swells, contains

The oak's vast branches in its milky veins;
Each ravelled bud, fine film, and fibre line,
Traced with nice pencil, on the small design.
The young narcissus, in its bulb compressed,
Cradles a second nestling on its breast,
In whose fine arms a younger embryo lies,
Folds its thin leaves, and shuts its floret eyes.
Grain within grain, successive harvests dwell,
And boundless forests slumber in a shell."

The RECEPTACLE, or torus, is the apex of the flower-stalk, into which all the organs of the flower are seated or inserted. It is *chaffy*, when the surface is set with a thin substance like chaff, or with hairs or bristles, by which the florets are separated, 166; *naked*, when entirely smooth and free from bristly particles, 167.

FLOWERS are *simple*, when they have no part of fructification common to many flowers, as the rose; *aggregate*, when they have a common individual receptacle, the anthers all separate and the florets usually on stalks, as in scabious and teasel, 170; *compound*, when consisting of numerous florets, all sessile, or seated on a common, undivided receptacle, and inclosed in one contiguous calyx, it being essential that the anthers are united in the form of a cylinder. INFLORESCENCE is the term used to express the particular manner in which the flowers are situated upon a plant: it is a *whorl*, when the flowers surround the stem in a sort of ring, though they may not be inserted on all sides of it, 171, but merely on two opposite sides, and even on one side only, 172; a *raceme*, or cluster consisting of numerous rather distant flowers, each on its own stalk, and all connected by one common stalk or axis, as a bunch of currants, 173; a *spike*, when bearing numerous flowers, ranged along one common stalk, without any, or at least very short, partial footstalks, as the common plaintain, 174; a *corymb*, when simulating a spike, with the exception of the partial flower-stalks being longer as they descend, so that all the flowers are nearly on a level, as in the wild thorn, 175; a *fascicle*, when the flowers are on little footstalks, variously inserted and subdivided, collected

into a close bundle, level at the top, as in sweetwilliam ; a *head*, or tuft, when bearing the flowers sessile, as in common thrift, 176; an *umbel*, when there are several flower-stalks or rays nearly equal in length, spreading from one common centre, their summit forming a level, convex, or even concave surface, 123 ; a *cyme*, similar in appearance, but with flower-stalks which, though they, as in the former case, spring from a common centre, in this divide and variously subdivide, as in the elder and guelder rose, 169 ; a *panicle*, when bearing the flowers in a sort of loose, subdivided bunch or cluster, without any order, as in oats, 177 ; a *thyrse*, or bunch, when in a dense and close panicle, with more or less of an ovate figure, as in the lilac, 178.

Having finished, in a great measure, the anatomy of plants, we examine the functions of the organs we have gone over, before proceeding to explain the Linnean system of classification.

After food is taken into the stomach, and the chyle is formed by the action of the gastric fluid and bile, it requires still further purification, for which purpose it must pass through the lungs. When there, its carbonic acid is given off and oxygen received instead, and the process thus completed, it is permitted, under the name of ARTERIAL BLOOD, to traverse the system and supply its wants. It meets, in many places, little deputations of the life power, which, with their instruments of operation, are called GLANDS. These agents seize upon whatever they require from the blood, and work it up into different substances. It is thus that the lachrymal gland secretes tears ; the salivary gland, saliva ; and the liver, bile.

Animals exist only on organized matter ; plants on inorganic matter, or elementary atoms. The principal food of the latter, and the elements of which it must be composed, are OXYGEN, HYDROGEN, CARBON and (rarely) NITROGEN : water gives the first two, and the atmosphere mostly the remainder. The salts that enter into this composition are a minor consideration,

and need not be mentioned in this place. We can see from this, that if plants are denied locomotion, the want is amply compensated, by the readiness with which food is at all times attainable. Every root sends off fibres, at the end of each of which is a bundle of little leech-like mouths, called spongioles ; these suck up from the soil whatever they require, and act the part of stomachs, by instantly digesting it. Examined in its most simple state, the sap is found to consist of water, mucilage and sugar ; thereby proving the change must have taken place immediately after its entrance. Like the chyle in the human stomach, the TRUE SAP requires a passage through the vegetable lungs, commonly called leaves, to perfect it. When conveyed to them by an ascending series of vessels, its oxygen is given off, and carbonic acid absorbed, and then, under the name of PROPER JUICE, it is carried by another set of vessels to every part of the plant, to subserve the functions of nutrition and secretion.

The respiration of animals and vegetables, is exactly opposite. Each receives what the other rejects, and what would be poison to the one, is food to the other. What an immense distance, Flint beautifully observes, separates a spire of grass from man! Yet on the frail tribes of vegetation, by a double necessity, our lives depend. Astonishing creation, from which nothing can be taken without the destruction of all! Saadi's fable of the nightingale and rose, proves that he understood as a philosopher the harmony which he sung as a poet. The nightingale is imprisoned in a cage of glass, with a rosebush in full bloom. Each gives life to the other. Deprived of fresh air, the bird would soon cease to swell his little throat with harmony. The rose greedily absorbs the air which has been rejected by its loved philomel, and blushes to brighter tints ; respires, transforms, and returns it purified, to be again inhaled by the bird, which again decomposes it, to be neutralized anew by the rose. When the bird at length expires, singing its dirge of gratitude, the rosebush withers and dies.

Similar to the glands that produce the various secretions in the human body, plants are provided with little factories of the same kind, which, from the sap, manufacture the essential oils, as the cinnamon, rose, orange and lavender; the varieties of salts, as the citric and oxalic acids, with their compounds; and the deadly poisons, as the laurel and upas. Principally by varying the proportions in the four elements we have mentioned, are we presented with an immense number of diverse substances.

The organic basis of vegetable tissue is MEMBRANE and FIBRE; the first is in sheets, varying in transparency, and generally tearing readily; the second has been compared to hair of inconceivable fineness. Cellular tissue, which consists of little bladders of various shapes, adhering in masses, is sometimes made of the latter, unconnected with the former. According to Lindley, it is transparent, and in all cases colorless; when appearing otherwise, the color always caused by matter contained within it. The brilliant colors of vegetable matter—the white, blue, yellow, scarlet, and other hues of the corolla, and the green of the bark and leaves—are not owing to any difference in the color of the cellules, but to coloring matter of different kinds which they contain, and which they hold separately from each other. The bright, satiny appearance of many richly colored flowers, depends upon the colorless quality of the tissue. Thus, in THYSANOTUS FASCICULARIS, the flowers of which are of a deep, brilliant violet, with a remarkable satiny lustre, that appearance will be found to arise from each particular cellule containing a single drop of colored fluid, which gleams through the white, shining membrane of the cellules, and produces the flickering lustre that is perceived. Cellules develop with great rapidity. Some of the gourd tribe have developed sixty-six millions in a minute.

Lindley observes, that the internal structure of the stems of flowering plants, is subject to two principal, and to several subordinate modifications. The former are well illustrated

by such plants as the oak and the cane, specimens of which may be easily obtained for comparison. A transverse slice of the former exhibits a central cellular substance of PITH, an external cellular and fibrous ring, or BARK, an intermediate WOODY mass, and certain fine lines, radiating from the pith to the bark, through the wood, and called MEDULLARY rays; this is called EXOGENOUS STRUCTURE. In the cane, on the contrary, neither bark, wood nor medullary rays are distinguishable; the transverse section exhibits a large number of hard spots, caused by the section of bundles of woody tissue and a mass of cellular substance in which they lie imbedded. This kind of structure is called ENDOGENOUS. In both cases there is a cellular and vascular tissue, distinct from each other, by a diversity in the arrangement of which the differences above described are caused. The cellular system of an exogenous stem occupies the centre and circumference, which are connected by thin vertical plates of the same nature as themselves. The central part is the pith, *a*, that of the circumference is the bark, *b*, and the connecting vertical plates are medullary rays, *c*. The PITH is a column of cellular tissue, arising at the neck of the stem and terminating at the leaf-buds, with all of which it has a direct communication. Its office is to supply the young wood with the juices of which it is full, during the early life of the plant; and, like the marrow in our bones, to act as a reservoir of nourishment in times of necessity. The BARK is the external coating of the stem, lying immediately over the wood, to which it forms a sheath, and from which it is always separable. The outside of it is a mere cuticle, or skin, and the inside a lining of woody fibre, one layer being added each year; and this being always added from within, causes the outside rind to crack, in many cases, by the extension. Between the bark and the wood a secretion is exuded from both, termed the CAMBIUM.

Every year a new layer of wood is deposited; the first layer surrounding the central pith, and with nothing but an

outside cuticle, grows freely. The second year a new layer is deposited, tightly compressing the first, which is also receiving nourishment and rapidly growing. As the first cannot advance downwards nor sideways, it rises upwards, pushing above the second; and thus the plant increases in height the amount of its vertical extension. The third layer compresses the second, as the second did the first, with exactly the same results; the first still pressing upwards and keeping in advance. At this stage the whole presents the appearance of a telescope drawn out. The wood, which is still capable of being pressed upward, takes the name of ALBURNUM; but it has arrived at maturity when it becomes so hard by continued pressure, as to be incapable of yielding to it. It is now called the HEART-WOOD, or DURAMEN. When the first, or original layer, has attained this point, the others follow naturally in succession, according to their respective ages. Wood is always white until it reaches this last stage of consistence; after that, a coloring matter of various shades is deposited in it. Mahogany, rosewood and ebony, were once thus white. The formation of the wood is the reverse of that of the bark; and we can now see the reason why stems of this kind are called EXOGENOUS, literally, *outside growers*. As one zone, or circle of wood, is formed each year, counting the rings will insure a knowledge of the age of the tree. Exogenous plants are always DICOTYLEDONES.

Endogenous plants generally belong to the tropics. Their cellular system, says Lindley, instead of being distinguishable into pith, bark and medullary rays, is a uniform mass, in which the woody matter lies embedded, in the form of thick fibres. Of this description are the palm, cocoa-nut, date and sugar-cane. The stem is cylindrical, being of the same diameter from top to bottom. This diameter is increased by the constant addition of fibrous bundles to the centre, which displace such as are previously formed, pushing them outwards, so that the centre, being always the most newly

formed, is the softest, and the external, being pressed closer and more compact, offers more and more resistance to the internal layers. At length a period arrives when they will give no more, their coats being exceeding hard and distended, and the stem attains its full horizontal dimensions, when it has no more than risen in height above the surface of the ground. A good simile has been made of it, in this stage of its growth, by comparing it to the stump of a tree recently cut down. The next year, as there is no longer any room to crowd itself lengthwise, it rises vertically; fresh layers perforate this, till, from the innermost, it becomes the outermost layer of wood. The leaves and fruit grow from the centre of the last shoot, and form a sort of cabbage, says a writer, on the top of a tree, which, if cut off, will cause it to immediately perish. They have, of course, no real bark. The same writer observes, that when a European wood-cutter begins to fell a tree of this description, he is quite astonished at its hardness. "If I have so much difficulty with the outside," says he, "how shall I ever get through the heart of the wood." But he soon discovers that the trees of the tropical climes have tender hearts, which makes it easy to perforate them, and renders them peculiarly appropriate for the masts of vessels, pipes for the conveyance of water, and such like purposes.

Fig. 229—*Germination of a monocotyledon*, or endogenous plant—*a*, PIVOT, OR RADICLE; *bb*, accessory roots, shooting from the bottom of the stem; *c*, cotyledon, or first leaf; *dd*, second and third leaves, called primordial; *cc*, common leaves of the plant.

Fig. 230—*Horizontal section of the stem of a monocotyledon*, or endogenous plant—which shows the scattered fibres which compose the wood, having neither bark, pitch, medullary rays, nor distinct layers.

Fig. 231—*Germination of a dicotyledon*, or exogenous plant—*a*, radicle, slightly branching; *b*, neck, or vital point between the root and stem; *t*, portion of the stem below the cotyle-

dons; *t*, portion of the stem above the cotyledons; *cc*, two opposite cotyledons; *d*, a simple primordial leaf; *ff*, common leaves.

Fig. 232—*Vertical section of the stem of a dicotyledon*, or exogenous plant—*ab*, the bark, composed of the vertical layer, *a*, and the internal bark, *b*; *cde*, the wood, composed of the alburnum, or young wood, *d*, and the pith, *e*. The circular zones represent the layers of wood, and the lines diverging from the centre, the medullary rays. Fig. 233 shows a branch turning its leaves towards the light.

The aggregate diameter of the branches of a tree is equal to that of the trunk from which they arise. To illustrate this fact, pines and firs are generally taken, as it may be seen at once how the diameter regularly diminishes as the lateral branches are given off. That wood is deposited from above downwards, will be readily apprehended by those who have read our previous explanations. It may be easily demonstrated in endogenous stems, in the Yucca, for instance, so plainly, that the woody threads may be traced from the base of the leaf into the stem, and downwards to their termination in the root. Every part of the plant is full of latent germs, that require but little irritation to call them into active existence. In the growing season this irritation is constantly produced; hence, as Lindley remarks, a plant is formed of multitudes of buds, or fixed embryos, each of which has an independent life and action; by its elongation upwards, forming new branches, and by its elongation downwards, forming wood and bark; which is therefore a mass of roots. We can see from this that a tree is not a separate existence, but is made up of an immense number of separate and independent existences; and the theory of the propagation of plants by layers, scions and grafts, becomes evident; it is merely multiplying by subdivision. A tree may be considered in the light of a huge vegetable polypus, every atom of which, by being separated from the rest, is able to produce a perfect being, similar to its parent.

A new department has been added to botany of late years, named MORPHOLOGY. It was this that constituted the subject of Göethe's *Metamorphosis*. It treats of the gradual transmutation of leaves—those epitomes of vegetable nature, containing within themselves the germs of independent existence—into all the various organs of a plant. It shows that bractea are leaves affected by the vicinity of the fructification; that the calyx and corolla are formed by the adhesion and verticillation of leaves; that the filament is a form of petiole, and the anther of lamina; and, finally, that the pistil is itself nothing but a rolled or convoluted leaf, with its midrib lengthened to form a style, the naked apex of which is the stigma. Linneus started the subject, which has been improved and extended, almost perfected, by his successors.

Linneus observed plants that had flowered and fruited for many successive years in pots, when transferred to a richer and warmer situation, break forth into branches, instead of flowers. Hence it was apparent to him, that branches and leaves could be produced from the provision made for flowers, provided circumstances were favorable to their development. He also found that when plants flowered, the buds which would have produced leaves the year after, were converted into a flower stalk a year earlier; whence it came to pass, that the rudimentary leaves lying in the bud, lost a part of their nutriment, in consequence of the sap being drawn off to the fructification; in consequence of which these leaves continued small, assumed a different structure, and easily withered, being known as bracteæ. In several plants the leaves of the calyx simulate exactly those of the stem, and often, when they differ from those of the stem, as in roses, excessive nutriment will cause them to swell out, and, in color texture, size and figure, exactly resemble the others; hence, he observed, it was not to be doubted, that the calyx and leaves of the stem were, in the beginning, alike. As to the petals of the corolla, it was often difficult to dis-

tinguish them at all from the sepals of the calyx. The white corolla of the Christmas rose becomes green after flowering, and, like the calyx, performs all the functions of leaves. In double flowers the stamens change into blossom-leaves. In a monthly rose, now in bloom in the editor's house, the filaments preserve their usual appearance, but the anthers are expanded into a broad petal. Outside of the row in which this is apparent, filament and anther have undergone transformation, and are true petals ; but inside, no change whatever has taken place from the natural type ; each filament has an anther, and performs its usual office in reproduction. That the pistillium is merely a folded leaf, can be proved from the fact that nothing is more common among roses, than to find it converted into perfect leaves. In the double cherry of the gardens, the place of the pistil is usually occupied by a leaf exactly similar to those on the branches, but rather smaller ; it is folded together, so that its margins, which are serrated, touch each anther; its midrib is actually lengthened into a process representing a style, which is, strangely enough—as if created expressly to prove, beyond doubt, the doctrine of metamorphosis—terminated by a stigma!

In the pod of the pea, the original structure is plainly discernible : it can easily be seen to consist of a leaf doubled over the seeds, with its edges united. When ripe, the midrib opens of itself, the seam formed by the soldering of the two edges also giving way; so that the pod is divided into two halves, to allow the seeds to detach themselves and fall to the ground. This action is called *dehiscence.* Καρπός, is the Greek word for fruit : επι, means over ; ενδον, within, and περί, around. Calling to remembrance the character of the leaf, will enable us now to understand at once its transformation into a peach. The outside skin is the under surface of the leaf; under the name of *epicarp*, the hairy cuticle may be easily recognized in its soft, downy skin. The cellular texture, by absorbing a great quantity of sap, swells out and forms the fleshy substance of the fruit; this is the *sarcocarp*, (σαρξ,) flesh.

Finally, the upper surface, as a writer well describes it, being in a great measure deprived of moisture, and as it were starved, its fibres contract, become tough, then indurated, are at length converted into a shell, or hollow stone, which affords most secure shelter for the seed; this is the *mesocarp.*

Lindley observes, that if we reflect upon all these phenomena, our minds can scarcely fail to be deeply impressed with admiration at the perfect simplicity, and at the same time faultless skill, with which all the machinery is contrived upon which vegetable life depends. A few forms of tissue, interwoven horizontally and perpendicularly, constitute a stem; the development, by the first shoot that the seed produces, of buds, that grow upon the same plan as the first shoot itself; and a constant succession of the same phenomena, causes an increase in the length and breadth of the plant; an expansion of the bark into a leaf, within which ramify veins, proceeding from the seat of nutritive matter in the new shoot; the provision of air-passages in its substance, and of evaporating pores on its surface, enables the crude fluid sent from the roots to be elaborated and digested, until it becomes the peculiar secretion of the species; the contraction of a branch and its leaves, forms a flower; the disintegration of the internal tissue of a petal, forms an anther; the folding inwards of a leaf, is sufficient to constitute a pistillium; and, finally, the gorging of the pistillium with fluid that it cannot part with, causes the production of a fruit.

Language of Flowers.

THE practice of divination by flowers is not altogether unconnected with the floral language. It is customary, in some countries, to pluck off the leaves of the marigold, or any flower of the aster kind, while certain words are repeated,

in order to ascertain the character or inclination of the individual. Göethe has touched upon this superstition, in his tragedy of Faust, in which Margaret plucks off the leaves of a flower, at the same time alternately repeating the words— "He loves me;" "He loves me not." On coming to the last leaf, she joyfully exclaims, "He loves me!" and Faust says: "Let this flower pronounce the decree of Heaven!"

This circumstance has been chosen by Retsch for the subject of one of his exquisite sketches, for the illustration of Faust, to an engraving of which Miss Landon wrote a little poem, entitled "The Decision of the Flower," containing these lines:—

> And with scarlet poppies around, like a bower,
> The maiden found her mystic flower.
> "Now, gentle flower, I pray thee, tell
> If my lover loves me, and loves me well;
> So may the fall of the morning dew
> Keep the sun from fading thy tender blue.
> Now I number the leaves for my lot:
> He loves not—he loves me—he loves me not—
> He loves me. Yes, thou last leaf, yes—
> I'll pluck thee not, for the last sweet guess!
> He loves me!"—"Yes," a dear voice sighed,
> And her lover stands by Margaret's side.

Rhubarb.

The Rheum—Rhubarb—genus, is in the class Enneandria, order Trigynia; essentially characterized by a colored calyx, or perianth, of six permanent pieces, inside which are the nine stamens, disposed in two series of six and three; stigmas, many-cleft and reflexed; fruit, a triangular, thin nut, with winged margins. The generic term comes from *Rha*, the ancient name of the river Volga, on whose banks, and those of the Caspian sea, it was first discovered and made known. It belongs to the natural order, Polygonaceæ, or Buckwheat tribe.

Long previous to the discovery by botanists of any plant which they thought could yield the officinal rhubarb of the shops, the drug had come into extensive use, and was considered almost indispensable in the practice of medicine. Attention had been directed to the subject, but without results of any importance, until, in the year 1732, Jussieu, at Paris, and Rhaud, at Chelsea, England, received some plants which they were assured afforded the commercial root. Linneus himself considered them in this light, and placed them in the first edition of his Species Plantarum, under the name of Rheum Rhubarbarum. After examination led to doubt whether, after all, the desideratum was supplied, and with a view to set the matter at rest, and thus completely ascertain the whole matter, Boerhaave procured from a Tartarian rhubarb merchant, the seeds of those plants whose roots he annually sold, and which were admitted at St. Petersburg to be the true rhubarb. These seeds, received under such auspicious circumstances, were carefully planted, and, when grown, to the surprise and vexation of those concerned in the investigation, produced two distinct species, the one known before, and named by Linneus, Rhubarbarum, (now called Undulatum,) and another, which Linneus, after examining a specimen, mentioned in the second edition of the Species Plantarum, as the Rheum Palmatum.

Dr. Mounsey sent some seeds from St. Petersburg to Dr. Hope, for the purpose of planting in the botanic garden at Edinburgh. These produced plants of the Palmatum. Dr. Hope, after a thorough examination, wrote a paper about them, which was read before the Royal Society of London; and of the great estimation in which the plant was held by him, we have the following proof:—"From the perfect similarity of this root with the best foreign rhubarb, in taste, smell, color and purgative properties, we cannot doubt of our being at last possessed of the plant which produces the true rhubarb, and may reasonably entertain the agreeable expectation of its being a very important acquisition to Britain."

De Gorter, who took considerable interest in the subject, had been all the time sending its seeds to Linneus, but the young plants which they produced constantly perished. At length he sent the fresh root, which succeeded very well at Upsal, and enabled the younger Linneus to describe it from the living specimen, in 1767, which was two years after Dr. Hope had written his account of the plant. As the seeds of both the Undulatum and Palmatum were transmitted from St. Petersburg as those of the true rhubarb, the chances between them thus far were equal. Pallas, while endeavoring to glean information relative to the plant from some Bucharian merchants, showed, in the course of his conversation, a leaf of the Palmatum, and was astonished at being told that the leaves of the real species were of an entirely different shape. The plant they described to him simulated in many respects the Compactum, seeds of which, as if to corroborate the account Pallas heard, were sent to England from St. Petersburg, as those of the true Tartarian rhubarb. But the subject did not rest here, for Dr. Wallick, Superintendent of the botanic garden at Calcutta, raised a new species, from seeds sent him as those of the true Chinese rhubarb, growing on the Himalaya mountains and the highlands of Tartary. This is the Australe. To complete its history, the account of Sieveis is necessary. He was an apothecary, sent to Siberia by Catherine II., to improve the cultivation of the native rhubarb, and asserts, from all the information he could command, that the seeds procured under the name of true rhubarb are false, and pronounced all the descriptions in all the Materia Medicas to be incorrect. As Sieveis did not, however, inform us which was the true plant, his opinions did not weigh as much as he expected, the majority of people being unwilling to throw away even a supposition, without something in its place.

And now, it may be asked, why we have entered into such a long, and, as it may appear to many, tiresome history, of the plant? We answer, for two reasons, one of which was to

give as full an account as possible, of each subject of Flora that we took up, and the other, to show what communion with nature can effect in the human mind. Those who endeavored to trace the true species of the plant, with the exception perhaps of Miller, did it with the benevolent desire of enriching their country, even with the prospect of loss to themselves, for there could, assuredly, be no personal gain. Had their desires been gratified, and the rhubarb cultivated to perfection, not only would they have been the means of affording profitable employment to many, but likewise of saving the money annually sent out of the country, for the purchase of the drug.

There is but little doubt that most of the representations we have related were true, so far as the fact that rhubarb was derived from each, and the error consisted in supposing a particular species to monopolize all the valuable qualities. Differences of soil, climate and culture will account for the fact of the rhubarb raised in this country and Europe, not being equal to that of Asia. All the species are perennial herbs, that is, they die down to the ground every winter. The roots are large and branching, sending up strong stems, varying from four to six or eight feet in height, surrounded at the base with large petiolate leaves, and terminating in racemose panicles of flowers. The petioles, or leaf-stalks, have a pleasant acidity, and when peeled and cut in pieces—care being taken to remove the small fibres—are much used as a substitute for fruit, in making pies. For this object alone, it is very extensively cultivated in the northern parts of the United States. The flavor is very similar to that of the gooseberry.

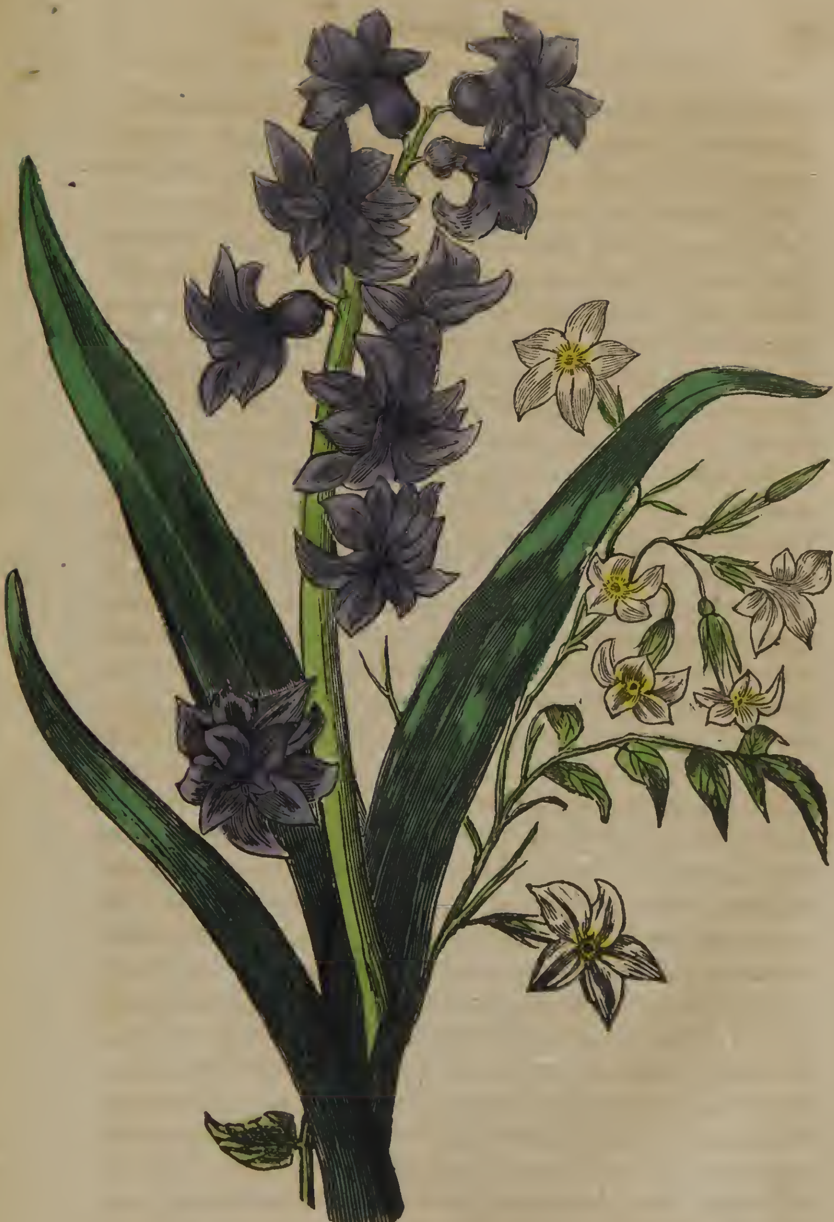
The Rheum Palmatum is a plant of very handsome appearance. The root is large, divided into thick, fleshy branches; it is externally of a yellowish brown color; internally, a bright yellow, with some reddish streaks. Its beautiful palmate leaves distinguish it at once from the other species; these are deeply cut into five or seven winding and pointed segments, somewhat rough, and supported by long,

smooth footstalks, which are slightly grooved on the upper surface and rounded on the sides. They are smaller in this than the other kinds, and, consequently, not in general cultivation for culinary purposes. The species is a native of some parts of Tartary, which country seems better adapted for the perfecting of its root, the properties of which are faintly retained in countries where the season of dormant vegetation is humid. We see no reason, however, to prevent it being raised here in as great perfection as in the East; and, it is probable, more attention will be paid it in future.

The Rheum Undulatum, is distinguished by its large, roundish root, sending off numerous branches, which penetrate deeply into the soil. Externally, it is of a dark brown color; internally, yellow. The leaves are long and pointed; their wavy or undulate appearance giving the specific name. They are somewhat hairy, having a deep sinus, or rounding incision at the base, and supported on footstalks with acute edges, compressed on the upper surface. It is a native of Siberia, and some think also of Tartary, having been found growing wild in the latter place.

The Rheum Compactum has smooth, shiny, obtuse leaves, inclining to lobe, and finely toothed on the margins. The root is thick; divides into long branches; dark brown externally, and reddish yellow within. It is found native in the vicinity of the great wall in China, and quite abundant towards the northern part of it.

The Rheum Australe, as we have mentioned, is native in the highlands of Tartary and the Himalaya mountains. The leaves are of a roundish heart-shape, obtuse, rough beneath and on the margin, have a wide sinus at the base, and are supported upon roundish footstalks, furrowed on the upper surface. The branches and flower-stalks are covered with rough protuberances. The calyx leaves are of an oblong, oval shape, finely scolloped on the edge. Dr. Wallick named it *Emodi*, from the native title of the plant.



HYACINTH, AND JASSAMINE OR JASMINE.

The Rheum Rhaponticum—Pie Plant—is distinguished by its smooth, obtuse, ovate, heart-shaped leaves, which are supported on footstalks, grooved above and rounded at the edges. The leaves are often two feet long, and over a foot in width, with the petioles nearly as long. The panicle is terminal, the greenish white flowers bursting from a white membranous bract, that encloses them, early in May. The root is large, fleshy, often branching; internally, of a yellow color, streaked with red, and externally of a reddish brown. This sends up a hollow stem, four feet in height. It grows on the banks of the Caspian Sea, in the deserts between the Volga and the Oural, and on the mountains of Krasnojar, in Siberia. The pie plant is supposed to be the *Rhubarbarum* of the ancients, from whence the modern name rhubarb is derived. We find this plant mentioned by Tusser, so early as 1573, as being then cultivated in England.

The hybrid rhubarb is, we are told, a native of more northern parts of Asia than the others, and of more recent introduction. It was first cultivated in England by Dr. Fothergill, in 1778, but did not come into general use as a culinary vegetable till several years after, having been introduced only about forty years since into the kitchen gardens of the English. This plant is of a much more lively green than the former species. The leaves are slightly heart-shaped, and very large, being, in favorable soils and good culture, four feet in length, footstalk and all. There was a plant of this species noticed lately, the leaves of which attained to great dimensions; one of these alone, being cut, weighed four pounds.

It is probable that but little attention, in regard to cultivation, is paid to this genus in its native soil. Mr. Bell, who journeyed from St. Petersburg to Pekin, and had an opportunity to see it in a growing state, tells us that it springs up spontaneously in tufts at uncertain distances, wherever the seeds have fallen upon heaps of loose earth thrown up by the marmots; for in places where the surface was not

disturbed, the dense thickness of the grass would prevent access to the soil. Twice a year the Tartars dig up all the roots they can find above six years old; the Chinese dig only in the winter. After cleaning, and the removal of the bark and smaller branches, the root is cut into conveniently-sized pieces, which are perforated with holes, through which a string is passed, to hang them up to dry. These rows are suspended in convenient places, out of the reach of the sun, in a good draft of air. Some have regular drying rooms; others, as the Chinese, lay them on heated stones at first, and then finish the process in the sun and air. Sevier tells us that so much time and trouble is spent in its preparation, that a year often elapses after collection, before the drug is ready to export, and then it has lost from four fifths to seven eighths of its weight in drying.

Rhubarb is cultivated with a little care, and though it occupies much space, the produce, under proper treatment, is very considerable. The petioles obtained from it will furnish a greater supply of material for pies than either apples or gooseberries, occupying an equal breadth of ground. It is deservedly, therefore, considered a good plant for the cottage garden—more especially, as it comes into productive bearing in the earlier spring, a time when fresh fruit cannot be obtained.

New plantations may be raised, either by sowing the seeds, or parting the roots. An English writer remarks, however, that the latter is not an eligible mode of culture, on account of the fact in relation to cultivated plants, that the produce of a sucker, when it has to make its own root, being always inferior in vegetative power to that which is originally from the seed; and vigorous vegetation is the quality most sought for in the rhubarb. The flowering stems should be removed, except in such plants as may be wanted for seed. If the seeds are sown in spring, the plants will be ready for planting out in autumn, and will come up strong enough for use the next spring, after which the plan-

tation will last many years. The plants of the hybrid kind require from two feet and a half to three feet of space for each, and those of the other species half a foot less; but the superior produce of the former, under favorable circumstances, will more than compensate for the greater breadth required.

Our own gardeners say, that depth and richness of soil, well pulverized, to allow the roots to penetrate deeply, are the great points in its cultivation. Plenty of water should be allowed the young plants, especially in very warm weather, taking care, by means of trenches, to allow none to settle about the roots. On the approach of cold weather, the beds should be covered with a light litter, which must be removed early in spring. The roots, for medicinal purposes, must not be taken up for at least seven years. After cleaning and slicing the roots two inches in thickness, they may be dried in the sun, on boards, turning them often, so as to prevent the escape of the yellow, juicy matter, which might otherwise flow out. In five days they may be strung, and then suspended in a shady and dry, airy situation. Three months, at the utmost, complete the process of preparation.

The Woody Nightshade.

TREAD aside from my starry bloom!
I am the nurse who feeds the tomb,
(The tomb, my child,)
With dainties piled
Until it grows strong as a tempest wild.

Trample not on a virgin flower!
I am the maid of the midnight hour;
I bear sweet sleep
To those who weep,
And lie on their eyelids dark and deep.

Tread not thou on my snaky eyes!
I am the worm that the weary prize;

The Nile's soft asp,
That they strive to grasp,
And one that a queen has loved to clasp!

Pity me! I am she whom man
Hath hated since ever the world began;
I soothe his brain
In the night of pain,
But at morning he waketh—and all is vain!

BARRY CORNWALL.

The SOLANUM DULCAMARA—WOODY NIGHTSHADE, or Bittersweet—is in the class Pentandria, order Monogynia. The generic name is derived from *solor*, to comfort, because ease from pain is given by its stupefying qualities. Its essential characters are: Calyx consisting of five or ten persistent sepals, somewhat united at the base; a rotate or campanulate corolla, commonly divided into five lobes at the border; the anthers cohering somewhat together at the top, in the form of a cone, and opening on the upper surface by two pores, to throw out their pollen; the berry which succeeds is two or three-celled and many-seeded.

The bittersweet is a climbing shrub, with a woody, thornless stem, sending off many branches, and attaining a height depending on situation, of six, seven, and even nine feet. The leaves are of a dull green color on the upper surface, lighter beneath; are supported on footstalks and given off alternately; are sharply ovate towards the point, soft and smooth; towards the upper part the leaves change in character, being furnished with lateral projections at their bases, giving the appearance of three leaflets being supported on one stalk, two of which are smaller than the third. This form of leaf is called hastate. The flowers are disposed in elegant cymose clusters, supported on branching petioles. The calyx is very small, purplish, and divided into five bluntish permanent segments, the remains of which may be seen on the berry. The corolla is wheel-shaped, reflexed, with five pointed segments of a violet blue color, and two shining green spots at the base of each segment. The filaments are short,

supporting erect anthers, whose beautiful lemon yellow color contrasts most happily with the purple of the corolla. The berries, which are of an oval shape and bright scarlet color, remain in handsome bunches after the leaves have fallen. It is mostly found climbing about hedges and thickets in low grounds, and blooms in July. It is common to Europe and America, and flourishes luxuriantly in damp and sheltered places, and on the banks of streams. It extends from New England to Ohio.

> O, star-eyed Science, hast thou wandered there,
> To waft us home the message of despair?
> Then bind the palm thy sage's brow to suit,
> With blasted leaf and death-distilling fruit.
> Ah! me, the laureled wreath that murder rears,
> Blood-nursed, and watered by the widow's tears,
> Seems not so foul, so tainted and so dread,
> As waves the *nightshade* round the sceptic's head.
>
> CAMPBELL.

Were it allowed, remarked a lady, for man to desire any thing in nature otherwise than it is, one might wish this poisonous plant were clothed in a garb less attractive, and more indicative of its deleterious qualities; as the beauty of its blossoms and fruit, known to the peasantry by the name of poison-berries, often proves fatally tempting to children. Dr. Wood, in the United States Dispensatory, says that the berries, which were formerly esteemed poisonous, and thought to act with great severity on the stomach and bowels, are now said to be innoxious: a statement differing considerably with that given by Hooper, who tells us they excite, when taken, violent vomiting and purging. Thirty of them were given to a dog, which soon became mad, and died in the space of three hours; and upon opening his stomach, they were found to have undergone no change by the powers of digestion: there, therefore, Hooper continues, can be little doubt of the deleterious effects of these berries; and as they may be easily mistaken by children for red currants, which they somewhat resemble, the circumstance is worthy

of notice. The specific name, Dulcamara, has its exact English synonym in bittersweet, which term was applied from the fact that the stalks, whether fresh or dried, have a slightly, though distinctly appreciable, bitter taste, followed by a remarkable sweetness, resembling liquorice. We have noticed this species growing on highlands, and also sometimes in gardens; but, like the rest of the genus, the coarse foliage prevents florists ornamenting their pleasure-grounds with it, despite the elegance and beauty of the starry blossoms. It likes moisture, and will grow well in a rich, light soil, a mixture of loam and peat, enriched with vegetable mould. The authoress of the following beautiful lines would banish it entirely from roadside and garden.

Away with thy tempting bloom—
  Go seek thee a fitting bower—
In the churchyard drear, by the haunted tomb,
Or the falling shrine, make thy cheerless home,
  Thou fair, but treacherous flower:
Or where mandrakes grow, by the wizard's cave,
And the adder lurks, let thy garlands wave.

For alas! alas! there's a deadly spell
  Conceal'd, thy leaves among;
And 'tis meet thou shouldst leave bright mead and dell,
Where duly at eve the wild birds swell,
  To more innocent flowers, their song:
Be the raven's croak, from the blasted tree,
And the owlet's scream, thy lullaby.

Yet, ere thou depart, let thy graceful wreath
  For one moment be lightly flung
Round the mirror of Beauty, to show her, beneath
What is lovely and bright, lurks the seeds of death;
  And, despite bland Flattery's tongue,
She might learn this lesson for after hour,
That beauty alone is a worthless dower.

Oh! teach her but this, then away, away,
  Where the wine flows free and bright—
And instead of the vine and the ivy spray,
Amid laughter and dance and festive lay,
  Oh! twine, in the reveller's sight,
Round the foaming bowl thy poisonous breath,
To show him its draught is linked with death.

Once more, and thy task is done—yea, go
  To thy last and fittest shrine;
Alas, that there should be a human brow
Where aught so baneful and false as thou
  May, without polluting, shine!
The sceptic—I tremble to breathe his name—
Thine be the garlands to crown his fame.

Aimé Martin says, that the ancients thought that TRUTH was the mother of the Virtues, the daughter of Time, and the queen of the world; and that the moderns think that Divinity hides herself at the bottom of a well, always mingling some bitter with her sweets; and hence appoints her to be emblemized, in floral language, by this poisonous climber, the bittersweet.

The Aspen Leaf.

I WOULD not be
A leaf on yonder aspen tree;
In every fickle breeze to play,
Wildly, weakly, idly, gay,
So feebly framed, so lightly hung,
By the wing of an insect stirred and swung;
Thrilling, e'en to a redbreast's note—
Drooping, if only a light mist float—
Brightened and dimmed like a varying glass,
As shadow or sunbeam chance to pass:
I would not be
A leaf on yonder aspen tree.
It is not because the autumn sere
Would change my merry guise and cheer—
That soon, full soon, nor leaf, nor stem,
Sunlight would gladden, or dew-drop gem—
That I, with my fellows, must fall to the earth,
Forgotten our beauty and breezy mirth,
Or else on the bough where all had grown,
Must linger on, and linger alone.
Might life be an endless summer's day,
And I be for ever green and gay,
I would not be, I would not be,
A leaf on yonder aspen tree!

Proudly spoken heart of mine,
Yet weakness and change perchance are thine,

More, and darker, and sadder to see,
Than befall the leaves of yonder tree!
What if they flutter—their life is a dance;
Or toy with the sunbeam—they live in his glance;
To bird, breeze and insect, rustle and thrill,
Never the same, never mute, never still—
Emblems of all that is fickle and gay:
But leaves in their birth, but leaves in decay—
Chide them not—heed them not—spirit, away!
Into thyself, to thine own hidden shrine:
What there dost thou worship? what deem'st thou divine?
Thy hopes—are they steadfast, and holy, and high?
Are they built on a rock? are they raised to the sky?
Thy deep, secret yearnings—oh! whither point they,
To the triumphs of earth, to the toys of a day?
Thy friendships and feelings—doth impulse prevail,
To make them and mar them, as wind swells the sail?
Thy life's ruling passion—thy being's first aim—
What are they? and yield they contentment, or shame?
Spirit, proud spirit, ponder thy state,
If thine the leaf's lightness, not thine the leaf's fate.
It may flutter, and glisten, and wither, and die,
And heed not our pity, and ask not our sigh;
But for thee, the immortal, no winter may throw
Eternal repose on thy joy or thy wo:
Thou must live—live for ever—in glory or gloom,
Beyond the world's precincts, beyond the dark tomb.
Look to thyself, then, ere past is Hope's reign,
And looking and longing alike are in vain;
Lest thou deem it a bliss to have been, or to be,
But a fluttering leaf on yon aspen tree. Miss Jewsbury.

The Poplar.

The poplars belong to the natural order Salicaceæ, or the willow tribe, which is composed of trees and shrubs, with alternate leaves seated on footstalks. The flowers diœcious, the male on one plant, the female on another. Both kinds are in catkins, and without either calyx or corolla. Stamens various in number, sometimes united at the bases. Two stigmas, and a one or two-celled ovary, with numerous ovules. Fruit, a seed-vessel, opening on one side only. Seeds numerous, hairy, and without albumen.

The Populus—Poplar—genus, is characterized by a cylindric ament; bracts laciniate, fringed; scales entire, oblique and pear-shaped. The male flowers with from six to twenty stamens attached to the scale. The female flowers with four-cleft stigmas, and a superior two-celled capsule. The essential name is supposed to be derived from *populus*, the people, because in olden times they fringed the promenades of Rome, under the name of the people's trees. Others do not scruple to assert that the name was given from the perpetual agitation of the leaves simulating the ignorant and discontented populace. The older writers give it from πολυς, many, on account of the multitude of shoots.

We have many species of this genus in the United States. They are very common in our parks, having almost entirely supplanted the plane, or sycamore trees, which were so exceedingly objectionable, on account of the number of insects infesting them. The insects dropped down on persons passing, and remained attached to their clothes, giving the first notice of their presence in efforts to crawl down the neck. The editor has frequently had twenty caterpillars collect on his hat during a walk down East Broadway. The rows of poplar trees in Pennsylvania Avenue, Washington City, which were considered among the finest specimens of the genus in the country, were cut down a few years since, when the avenue was Macadamized, to the great regret of many of the inhabitants.

The Populus Alba—White Poplar—is specifically distinguished by the roundish, heart-shaped leaves, which are lobed and toothed on the margin; they are smooth, and of a sea-green color above, downy, and very white beneath; the fertile catkins are of an ovate shape; stigmas, four.

The Abele, or white poplar, is a beautiful and rather curious tree. An English writer remarks on the silvery down of the under-side of the leaves, which shows so elegantly when they are agitated by the wind. The seeds are winged, with a considerable quantity of a very fine and white

down, which, in spring, sometimes fills neighboring houses with flue, as though the beds had been beaten to pieces. Some persons think that this down, as it resembles cotton, might be spun or woven for the same purposes. It is described as one of the most valuable of the English indigenous trees, growing to the height of more than ninety feet, towering its superb head upon a straight, silvered trunk. The ancients consecrated it to Time, because the leaves are in continual agitation, and the contrast between the two surfaces were supposed to indicate the alternation of day and night.

The Populus Tremulordes—American Aspen—is denoted by its orbicular-cordate and abruptly acuminate leaves; these are dentate-serrate, and pubescent on the margin. This species is very frequently met with in our Northern States, and is very common about New York. It grows most plentifully in woods and open lands, where the soil is of a middling quality. The trunk often rises to a height of thirty-five feet, with a diameter of twelve inches. The leaves are between two and three inches long, and from an inch to an inch and a half wide. The bark is of a greenish color, smooth when young, but growing furrowed as it becomes old. The leaves are of a dark green color above, and very light below; it is in bloom many days before these are put forth, the aments, of about two inches in length, hanging from the end of the branches; they are of an oval shape, and made up, mostly, of silky plumes.

The wood is light and soft, with very little strength, and of no use as timber or fuel; we are told that it is sometimes divided into layers, for the manufacture of summer hats.

From the tremulousness of its leaves it has derived its name, and has also become a by-word and a proverb. A writer remarks, that among the wild glens of the Scottish Highlands—fit nurseries for superstitious fancies and traditionary legends—it is a current notion that the cross was made of this tree, and that, therefore, its leaves can never

rest: a fancy hinted at in one of the pieces of poetry heading this article. To the philosopher, science offers a more satisfactory solution of the problem. Drummond says, that to the compression of the petiole, we are chiefly to attribute the tremulousness, or turning motion of the leaves of this tree. The compression is chiefly at the end next the leaf; and as it is vertical, while the position of the leaf is horizontal, the slightest breath of wind throws the latter into agitation.

An English writer, speaking of the poplars, remarks that the exceeding rapidity of their growth is some compensation for the poorness of the timber. In favorable situations it will make shoots three inches in diameter, and sixteen feet long, in the course of a single season. Though the wood is soft, and far from durable, it is not apt either to swell and shrink, or warp, and is, besides, very light; so that it is employed for butcher's trays, hog-troughs, and other articles, in which lightness and cheapness are preferred to durability. It is possible, that in consequence of the rapidity with which the poplar grows, and the ease with which it can be worked, that, on the spot where it is produced, it may be more economical for common household purposes, and for casks and packages for dry goods, than more durable timber. It is a tree largely cultivated by the Dutch, being well adapted to their moist soil and climate. On the continent of Europe, a species of poplar is manufactured into thin slices, called sparterie, which is made into ladies' bonnets. The seeds of the white poplar, also, have been attempted to be manufactured into paper, as well as cloth. Pallas, in his travels, attempts to show that the cotton of the *populus alba* was as valuable as that produced by the *gossypium* of America; but no experiments upon it have as yet been successful.

An English lady thus beautifully moralizes on this tree, so famed in the annals of superstition:—

Daylight is closing, but the west
  Still with the pomp of sunset glows;
And crimson cloud on mountain's breast,
  And tower and spire, its radiance throws;
While, one by one, in eastern skies,
The stars which usher evening, rise.

How deep, how holy is the calm—
  Each sound seems hushed by magic spell,
As if sweet Peace her honied balm
  Blent with each dew-drop, as it fell.
Would that the cares that men pursue,
A pause, like this of nature, knew.

Yet, in this deep tranquillity,
  When e'en the thistle's down is still,
Tremble's yon towering aspen tree,
  Like one whose by-gone deeds of ill
At hush of night before him sweep,
To scare his dreams and "murder sleep."

Far off, in Highland wilds, 'tis said,
  (But Truth now laughs at Fancy's lore,)
That of this tree the cross was made,
  Which erst the Lord of glory bore;
And of that deed its leaves confess,
E'er since, a troubled consciousness.

We boast of clearer light; but say,
  Hath Science, in her lofty pride,
For every legend swept away,
  Some better, holier truth, supplied?
What hath she to the wanderer given,
To help him on his road to heaven?

Say, who hath gazed upon this tree
  With that strange legend in his mind,
But inward turned his eye to see,
  If answering feeling he could find;
A trembling for that guilt which gave
His Saviour to the cross and grave?

And who such glance did inward bend,
  But scorned the apathy and pride,
Which made him slight that more than friend,
  For him who bled, for him who died;
Nor prayed his callous heart might prove
What 'tis to tremble, weep and love.

Medical Department.

RHUBARB.—Three varieties of this article are brought into the market—the Chinese, Russian and European; but a good article can be selected without reference to the name of the place from which it was exported. The marks of the goodness of rhubarb are, the piece being firm and solid, not flinty or hard; of a lively color, when cut; when broken, presenting reddish and yellow veins, intermingled with white; easily powdered, being then of a fine, bright yellow color; imparting to the spittle, when chewed, a deep saffron tinge, and not proving strong or mucilaginous in the mouth; of a subacrid, bitter, and somewhat styptic taste; and, finally, a light, though decidedly odorous smell.

The purgative qualities of rhubarb are extracted more perfectly by water than by rectified spirit. The part remaining after the action of water, is almost, if not wholly, inactive; whereas, after repeated digestion in spirit, the residue still proves considerably purgative. Much has been said concerning the valuable properties of the extract of rhubarb, but the virtue of the watery infusion, on being inspissated by a gentle heat, is so much diminished, that a dram of the extract has less effect than a scruple of the root in substance. The spirituous tincture loses less; half a dram of its extract proving moderately purgative.

The qualities of the root are those of a gentle purgative, and so gentle, that it is often inconvenient, on account of the bulk required for a dose, which, to an adult, must be from twenty-five to thirty-five grains. When given in a large dose, it will occasion some griping, as other purgatives do; but it is hardly ever heating to the system, or shows the other effects of the more drastic purgatives. The purgative quality is accompanied by a bitterness which is often useful in restoring the tone of the stomach, on which organ its

bitterness makes it sit better than most purgatives. Its operation agrees well with that of the common neutral laxitives, such as magnesia; both together form excellent associates in diseases of the stomach and bowels, more especially in children. Some degree of astringency is always evident; and as this quality acts when that of the purgative has ceased, so in cases of diarrhœa, when it is desirable to empty the bowels, rhubarb has been considered as the most proper remedy to be employed. On account of the styptic property, rhubarb should not be used alone, in keeping the bowels regular, in cases of habitual costiveness; but when so employed, ought in all cases to have its binding tendency counteracted by a union with soap. When a small piece is kept in the mouth, and no more is swallowed than what the saliva dissolves, it has been found of great service to dyspeptic persons, whose bowels are generally constipated. Boiling the rhubarb a considerable time, or roasting it, will diminish the purgative properties without affecting its astringent virtues; and either operation is sometimes performed, to fit it for exhibition in cases of severe diarrhœa.

Pillulæ Rhei Compositæ—Compound Pills of Rhubarb.—Take of rhubarb, in powder, *an ounce;* aloes, in powder, *six drams;* myrrh, in powder, *half an ounce:* rub these well together, adding *half a fluid-dram* of oil of peppermint, and then beating the whole into a mass, with a sufficient quantity of syrup of orange-peel; this will make two hundred and forty pills. It is a warm tonic laxative, much employed, in doses of from two to four pills twice a day, in cases of costiveness, accompanied by debility of the stomach.

There are various tinctures of rhubarb, but all are of doubtful utility. The simple tincture is made by pouring a *pint* of alcohol and a *pint* of water on *three ounces* of bruised rhubarb, and *half an ounce* of bruised cardamon seeds, allowing it to macerate *fourteen* days, and straining. The dose, as a purgative, is from a half to a whole fluid ounce; as a stomachic, from one to three fluid-drams.

Syrupus Rhei—Syrup of Rhubarb—is made by pouring a pint of boiling water on two ounces of bruised rhubarb, and allowing it to macerate twenty-four hours; then forming a syrup, by adding to the strained liquor, over a gentle heat, two pounds of refined sugar. This is a mild cathartic, especially suited to infants, to whom it may be given in doses of one or two teaspoonfuls, (fluid-drams.)

Syrupus Rhei Aromaticus—Spiced Syrup of Rhubarb—is made by macerating in a *quart of alcohol* and water, equal parts, *two ounces and a half* of rhubarb, *half an ounce* each of bruised cinnamon and cloves, and *two drams* of bruised nutmeg. After standing two weeks, strain, evaporate the liquor in a water bath, down to a pint, and while still hot, mix with it *six ounces* of simple syrup. [Many years ago, while in the drug business, the editor used to fill an iron pot half full of water and place it on a furnace, and then putting the proper ingredients in a tin pail, let the pail float on the boiling water; a handy method of preparing a water bath.] This is a warm stomachic laxative, not powerful enough to affect grown persons, but well calculated for exhibition in the bowel complaints of infants; and much used for this purpose in the summer season, when such complaints abound in children. The dose is a teaspoonful, repeated every three or four hours, till the evacuations from the bowels indicate the operation of the medicine.

Bittersweet.—The root and stalk are both possessed of the medicinal properties of the plant; the latter, however, is the part generally employed. The plant is directed to be gathered in autumn, when the leaves have fallen off, and then only the extreme twigs to be selected. That grown in elevated and airy situations is pronounced the best. As found in the shops after drying, the twigs are about the thickness of a goosequill, of indeterminate lengths, wrinkled, and of a dirty greenish color; the thin bark, interior woody portion and central pith, are all distinctly seen. It has no smell when dried, but when bruised in the recent state,

emits a heavy nauseous odor. Boiling water will extract all the virtues, or in other words, dissolve the peculiar principle called *solanine*, on which its properties depend. This is supposed to exist in the bittersweet, combined with malic acid. To procure *solanine*, a decoction is made of the bittersweet, to which an alkali, ammonia or magnesia, is added. Either will unite with the malic acid, and set the solanine free. This falls to the bottom, in the form of a precipitate, which is then dissolved in cold water; boiling alcohol is added to this, which causes the mixture to deposite the alkaline principle when cooling, and still further by evaporation. As then obtained, it was a white powder, without smell, and fusing at 212° Fahr. It is a poison, acting first as an emetic, and then narcotic. Another principle has also been discovered, needless to mention here.

Bittersweet possesses narcotic properties, and the power of increasing the secretions, particularly those of the kidneys and skin. Its depressing power is known when the system is brought under its influence, by the slow and weak circulation, and bluish color of the hands and face. Though recommended in various diseases, it is now chiefly employed in the scaly eruptions of the skin, with a very beneficial effect, more especially when combined with the antimonials.

DECOCTUM DULCAMARA—DECOCTION OF BITTERSWEET—is prepared by pouring a *pint and a half* of water on *an ounce* of the bruised stalks, and boiling down to a pint. It is given in doses of from one to two fluid ounces, four times a day, gradually increased until some tokens of derangement in the system shows its activity.

An extract is prepared, of which the dose is from five to ten grains. The dose, when powdered, is from twenty-five to sixty grains.

In diseases of the skin the decoction is applied outwardly, as well as taken inwardly. Antaphrodisiacal properties are ascribed to it, and Haller sums up its qualities, as a mild, and more resolvent form of the nightshade.

Introductory Department.

That part of the material world which bears the name of the Vegetable Kingdom,* consists, like the Animal, of a vast multitude of species, whose outer and inner forms alike offer a prodigious diversity of modifications of one common, simple plan of structure. Organic vesicles, usually extending into tubes of various kinds, exclusively constitute what we call Vegetation; but this simplicity of nature is attended by very complex details of arrangement, as is shown in trees, whose framework is knit together by countless myriads of such vesicles and tubes, entangled with an astonishing intricacy of simple arrangement.

Any living combination whatsoever of such vesicles constitutes a plant; but as the combinations themselves are countless, so are the resulting external forms; for, although two or three words may suffice to express all combinations whatsoever, in their most general sense—as when the name thallus is given to the simplest expansion of vegetable matter, while all the more complex forms are included under the name of axis and its appendages—yet ingenuity is exhausted in the attempt to distinguish by appropriate terms the manifold external forms assumed by that axis, and the parts which it bears.

Hence it is that wherever the eye is directed it encounters an infinite multitude of the most dissimilar forms of vegetation. Some are cast ashore by the ocean, in the form of leathery straps or thongs, or are collected into pelagic meadows of vast extent; others crawl over mines, and illuminate them with phosphorescent gleams. Rivers and tranquil waters teem with green filaments; mud throws up its

* This is taken from the highest and latest authority, Lindley, whose "Vegetable Kingdom," revised, etc., 1847, reached us as we were preparing our article on classification. We have somewhat abridged his introduction, and added a full explanation of the Linnean System, as nearly as possible in its author's words. [Editor.]

gelatinous scum; the human lungs, ulcers, and sordes of all sorts bring forth a living brood; timber crumbles to dust beneath insidious spawn; corn crops change to fetid soot. All matter in decay is seen to teem with mouldy life, and those filaments, that scum-bred spawn and mould, alike acknowledge a vegetable origin. The bark of ancient trees is carpeted with velvet, their branches are hung with a grey-beard tapestry, and microscopical scales overspread their leaves; the face of rocks is stained with ancient colors, coeval with their own exposure to air; and those, too, are citizens of the great world of plants. Heaths and moors wave with a tough and wiry herbage; meadows are clothed with an emerald mantle, amidst which spring flowers of all hues and forms; bushes throw abroad their many-fashioned foliage, twiners scramble over and choke them; above all wave the arms of the ancient forest, and these, too, acknowledge the sovereignty of Flora. Their individual forms, too, change at every step. With every altered condition and circumstance new plants start up. The mountain-side has its own races of vegetable inhabitants, and the valleys have theirs; the tribes of the sand, the granite, and the limestone are all different; and the sun does not shine upon two degrees on the surface of this globe, the vegetation of which is identical: for every latitude has a Flora of its own. In short, the forms of seas, lakes and rivers, islands and peninsulas, hills, valleys, plains and mountains, are not so infinitely diversified as that of the vegetation which adorns them.

Botanists have gathered together these endless forms, have studied and arranged them, and calculated their numbers, which amount to more than 92,000 species: a mighty host, whose ranks are daily swelled by new recruits.

This vast assemblage has not been gathered together in a few years; it is coeval with man, and we cannot but feel that the study of the distinctions between one plant and another commenced with the first day of the creation of the

human race. The name, indeed, of Botany, is modern; but its antiquity dates from the appearance of our first parents. We may assume it as a certain fact, that the Vegetable Kingdom was the first to engage the attention of man, for it was more accessible, more easily turned to useful purposes, and more directly in contact with him than the Animal. Plants must have yielded man his earliest food, his first built habitation; his utensils and his weapons must alike have been derived from the same source. This could not fail to produce experience, and especially the art of distinguishing one kind of plant from another, if it were only as a means of recognizing the useful and the worthless species, or of remembering those in which such qualities were most predominent. This would involve, from the very beginning, the contrivance of names for plants, together with the collection of individuals into species; and the mental process by which this was unconsciously effected, gradually ripened into the first rude classifications that we know of. By placing together individuals identical in form and the uses they could be applied to, species were distinguished; and by applying a similar process to the species themselves, groups, analogous to what we now call genera, were obtained. The last step was to constitute classes, which were recognized under the well-known names of "grass, and herbs yielding seed, and fruit trees yielding fruit."

But as human intelligence advanced, and a knowledge of things increased, such rude distinctions were improved, and when no means existed of appreciating the value of minute or hidden organs, the functions and existence of which were unknown, objects were at first collected into groups, characterized by common, external and obvious signs. Theophrastus had his water-plants and parasites, pot-herbs, and forest trees, and corn-plants; Dioscorides had aromatics and gum-bearing plants, eatable vegetables and corn-herbs; and the successors, imitators and copiers of those writers, retained the same kind of arrangement for ages. It was not till 1570

that Lobel, a Fleming, improved the ancient modes of distinction, by taking into account characters of a more definite nature than those which had been employed by his predecessors; but he was soon succeeded by others, among the most distinguished of whom were Cæsalpinus, an Italian, who wrote in 1583, the celebrated Tournefort, and especially John Ray, who flourished in the end of the seventeenth century.

The latter added much to the knowledge of his predecessors, and had so clear and philosophical a conception of the true principles of classification, as to have left behind him, in his *Historia Plantarum*, the real foundation of all those modern views, which, having been again brought forward at a more favorable time by Jussieu, are generally ascribed exclusively to that most learned Botanist and his successors. Ray, however, labored under the great disadvantage of being too far in advance of his contemporaries, who where unable to appreciate the importance of his views, or the justness of his opinions; and who, therefore, instead of occupying themselves with the improvement of his system, set themselves to work to discover some artificial method of arrangement, that should be to Botany, what the alphabet is to language, a key by which the details of the science may be readily ascertained.

With this in view, Rivinus invented, in 1690, a system depending upon the formation of the corolla; Kamel, in 1693, upon the fruit alone; Magnol, in 1720, on the calyx and corolla; and finally, Linneus, in 1731, on variations in the stamens and pistil. The method of the last author has enjoyed a degree of celebrity which has rarely fallen to the lot of human contrivances, chiefly on account of its clearness and simplicity; and in its day it effected a large amount of good.

The following is an explanation of the artificial system:—

THE SYSTEM OF LINNEUS.

CLASSES.

1. Monandria.	One stamen.
2. Diandria.	Two stamens, or stamina.
3. Triandria.	Three stamens.
4. Tetrandria.	Four stamens of equal length.
5. Pentandria.	Five stamens, anthers not united.
6. Hexandria.	Six stamens, all of equal length.
7. Heptandria.	Seven stamens.
8. Octandria.	Eight stamens.
9. Enneandria.	Nine stamens.
10. Decandria.	Ten stamens, filaments separate.
11. Dodecandria.	Twelve stamens to nineteen, inserted on the receptacle.
12. Icosandria.	Twenty or more stamens, inserted upon the calyx or corolla.
13. Polyandria.	Many stamens, inserted into the receptacle.
14. Didynamia.	Four stamens, two long, two short; flowers ringent.
15. Tetradynamia.	Six stamens, four long, two short; flowers cruciform.
16. Monadelphia.	Filaments united at bottom, but separate at top.
17. Diadelphia.	Filaments united in two sets; flowers papilionaceous.
18. Polyadelphia.	Filaments united in three or more sets.
19. Syngenesia.	Anthers united. Five stamens; flowers mostly compound.
20. Gynandria.	Stamens inserted on the pistil, or on a pillar elevating the pistil.
21. Monœcia.	Stamens and pistils in separate corollas, upon the same plant.

22. Diœcia.	Stamens and pistils in distinct corollas, upon different plants.
23. Polygyamia.	Various situations. Stamens only, or pistils only, along with bisexual flowers.
24. Cryptogamia.	Stamens and pistils inconspicuous.

According to Linneus, all known plants are distributed into different classes, orders, genera and species. The classes are twenty-four, and are derived from the consideration of the number; the number and origin; the number and proportion; the union; the separation, and the concealment of the stamina.

The character of the orders is most frequently taken from the *number* of the pistils; but sometimes from circumstances relative to the stamens, the pistils, or seed.

The essential characters, or marks of the genera, are taken from some other particulars of the flower. Generic descriptions are designed to contain an account of *all the most obvious appearances* in every part of the flower.

The species are mostly characterized from some peculiarities in the *stem* or *leaves;* sometimes from parts of the flower; and sometimes, though rarely, from the roots.

In some plants, owing, as we have before stated, to soil, situation or other causes, both the leaves and flowers are subject to variation. When this happens, they are called varieties.

The names of the first eleven classes are derived from the Greek words ανηρ, aner, *a male*, ανδρος, andros, the genitive case, and some Greek word prefixed, implying number, as,

Class I. Monandria, from μονος, monos, *one*, and ανηρ, aner, *a male.* Ginger, 179.

Class II. Diandria, from δις, dis, *two*, and ανηρ, aner, *a male.* Sage, 180.

Class III. Triandria, from τρεις, treis, *three*, and ανηρ, aner, *a male.* Iris, 181.

Class IV. Tetrandria, from τεσσαρες, TESSARES, *four*, and ανηρ, ANER, *a male.* Dogwood, 182.

Class V. Pentandria, from πεντε, PENTE, *five*, and ανηρ, ANER, *a male.* Flax, 183.

Class VI. Hexandria, from εξ, EX, *six*, and ανηρ, ANER, *a male.* Lily, 184.

Class VII. Heptandria, from ἑπτα, HEPTA, *seven*, and ανηρ, ANER, *a male.* Wintergreen, 185.

Class VIII. Octandria, from οκτω, OCTO, *eight*, and ανηρ, ANER, *a male.* Heath, 186.

Class IX. Enneandria, from εννεα, ENNEA, *nine*, and ανηρ, ANER, *a male.* Rhubarb, 187.

Class X. Decandria, from δεκα, DEKA, *ten*, and ανηρ, ANER, *a male.* Pink, 188.

Class XI. Dodecandria, from δωδεκα, DODEKA, *twelve*, and ανηρ, ANER, *a male.* Mignonette, 189.

Class XII. Icosandria, from ικοσι, IKOSI, *twenty*, and ανηρ, ANER, *a male.* Rose, 190.

Class XIII. Polyandria, is so called from πολυς, POLUS, *many*, and ανηρ, ANER, *a male.* Water Lily, 191.

Class XIV. Didynamia, from δις, DIS, *two*, and δυναμις, DUNAMIS, *power*. *Two* long and two short stamens. Catnep, 192.

Class XV. Tetradynamia, from τεσσαρες, TESSARES, *four*, and δυναμις, DUNAMIS, *power*. *Four* long and two short stamens. Horse Radish, 193.

Class XVI. Monadelphia, from μονος, MONOS, *one*, and αδελφος ADELPHOS, *a brother*. Stamens united by three filaments in one set. Geranium, 194.

Class XVII. Diadelphia, from δις, DIS, *two*, and αδελφος, ADELPHOS, *a brother*. Stamens united by their filaments in two sets. Pea, 195.

Class XVIII. Polyadelphia, from πολυς, POLUS, *many*, and αδελφος, ADELPHOS, *a brother*. Stamens united by their filaments in many sets. Orange, 196.

Class XIX. Syngenesia, from συν, SUN, *together*, and γενεσις,

GENESIS, *generation.* Stamens united by the anthers, which cohere in a ring. Burdock, 197.

Class XX. GYNANDRIA, is from γυνη, the female, most conspicuous here, and ανηρ, the male. Stamens upon the pistil. This flower is now placed in Monadelphia.

Passion Flower,* 198.

Class XXI. MONŒCIA, from μονος, MONOS, *one*, and οικος, OIKOS, *a house.* Stamens and pistils in distinct flowers on the same plant. Oak, 199.

Class XXII. DIŒCIA, from δις, DIS, *two*, and οικος, OIKOS, *a house.* Stamens and pistils in distinct flowers on separate plants. Hop, 200.

Class XXIII. POLYGAMIA, from πολυς, POLUS, many, and γαμος, GAMOS, *marriages.* Stamens and pistils, either in the same flower or on separate flowers. Fig, 201.

Class XXIV. CRYPTOGAMIA, from κρυπτος, KRUPTOS, concealed, and γαμος, GAMOS, marriage. Mosses, 202.

ORDERS.

The ORDERS of the first *thirteen* CLASSES are founded on the *number* of STYLES; or where this part is wanting, on that of the STIGMAS, thus:—

Order I. MONOGYNIA, one pistillum, is from μονος, MONOS, *one*, and γυνη, GUNE, *a female;* or, in other words, *one* STYLE, or *one* STIGMA. 203.

Order II. DIGYNIA, two pistilla, from δις, DIS, *two*, and γυνη, GUNE, *a female.* 204.

Order III. TRIGYNIA, three pistilla, from τρεις, TREIS, *three*, and γυνε, GUNE, *a female.* 205.

Order IV. TETRAGYNIA, four pistilla, from τετρας, TETRAS, *four*, and, γυνη, GUNE, *a female.* 206.

Order V. PENTAGYNIA, five pistilla, from πεντε, PENTE, *five*, and γυνη, GUNE, *a female.* 207.

Order VI. HEXAGYNIA, six pistilla. from εξ, HEX, *six*, and γυνη, GUNE, *a female.* 208.

* The Passion Flower is now placed in Monodelphia.

Order VII. Heptagynia, seven pistilla, from επτα, HEPTA, *seven*, and γυνη, GUNE, *a female.* 209.

Order VIII. Octagynia, eight pistilla, from οκτω, OKTO, *eight*, and γυνη, GUNE, *a female.* 210.

Order IX. Enneagynia, nine pistilla, from εννεα, ENNEA, *nine*, and γυνη, GUNE, *a female.* 211.

Order X. Decagynia, ten pistilla, from δεκα, DEKA, *ten*, and γυνη, GUNE, *a female.* 212.

Order XI. Dodecagynia, twelve pistilla, from δοδεκα, DODEKA, *twelve*, and γυνη, GUNE, *a female.* 213.

Order XII. Polygynia, many pistilla, from πολυς, POLUS, *many*, and γυνη, GUNE, *a female.* 214.

Class XIV. Didynamia, has its two orders. An apparent want, or the possession of a seed vessel, for the styles or stigmas here are not able to furnish the contrast desired, being constantly one.

Order I. Gymnospermia, apparently naked seeds, from γυμνος, GUMNOS, *naked*, and σπερμα, SPERMA, *seed.* 215.

Order II. Angiospermia, covered or capsuled seeds, from αγγειος, AGGEIOS, αγγος, AGGOS, *a vessel*, and σπερμα, SPERMA, *seed.* 216.

Class XV. Tetradynamia, has its two orders, viz.:

Order I. Siliculosa, a round pod, from silicula, *a little pod.* 217.

Order II. Siliquosa, a long pod, from siliqua, *a long pod*, and this from silo, *a nose turned up*, being usually curved. 218.

The orders of Class XVI., Monadelphia; Class XVII., Diadelphia; and Class XVIII., Polyadelphia, are founded on the characters of the former classes, thus: Order I. is Triandria, and so on to Order VI., Polyandria. In Class XVIII., Polyadelphia, we have even Order III., Icosandria, which includes the citrus, the *orange;* for the consideration of *union of filaments* supersedes that of either *number alone*, or of *number and insertion*, and the classical character was found here very convenient to form orders;

especially as Class XVII., Diadelphia, presented no variety in the pistilla.

The order of Class XIX., Syngenesia, likewise, could not be founded on the pistils, there being but one, but are constituted from the *disposition* of the *florets*, thus :

Order I. Polygamia æqualis, *equal marriage*, from πολυς, polus, *many*, and γαμος, *marriage*, implies, that the florets are numerous; and æqualis, *equal*, means that each flower is equally possessed of the two sexes; the florets are all alike, either ligulate or tubular florets. 219.

Order II. Polygamia superflua, *superfluous polygamy*, means that the florets in the *disk* (centre) being bisexual, produce seeds, and those in the *ray* (circumference) which are pistilliferous, are superfluous, as the former were sufficient to continue on the species, and are hence styled by Linneus, in his system, as *concubines*. 220.

Order III. Polygamia frustranea, *needless polygamia*, is so called from the florets in the *ray* being devoid of any sex, and their existence seemingly useless. But their petals serve as a defence for the central florets, by closing over them. 221.

Order IV. Polygamia necessaria, *necessary polygamy*, implies that the florets in the *disk* are stameniferous, and in the *ray* pistilliferous; and if those in *disk* were absent, there would be no seeds, hence the necessity of the pistilliferous flowers in the *ray*. 222.

Order V. Polygamia segregata, *separate polygamy*, is where the florets are all equal, that is, bisexual, as with the first order, but *separate*, segregata, by having *a calyx to each floret*, which separates the florets individually. 223.

Class XXI. Monœcia, has for its orders all the classes of *number*, also the class of *union of filaments when forming one set*, that of *union of anthers* and *union of the pistillum*.

Class XXII. Diœcia, the same; for, like Aaron's rod, which swallowed up all the rest, the consideration of *sexes*

apart overcomes all other ideas; each class rising *superior* to the preceding.

Class XXIII. Polygamia hence takes its orders: Order I., Monœcia; Order II., Diœcia; and Order III., Triœcia; the last is supposed to exhibit *bisexual*, *male* and *female flowers*, growing separately, on three distinct plants of the same species, from τρεις, TREIS, *three*, and οικος, OIKOS, *a house.*

Class XXIV. Cryptogamia, contains natural orders, such as the Filices, ferns, 224; Musci, mosses, 225; Jungermannia, liverworts, 226; Algœ, flags, 227; Fungi, mushroom, 228.

We are happy to say, that in this work our connection with the Artificial System is ended, and shall hereafter be confined to the Natural.

It was soon, however, perceived by those who studied the Vegetable Kingdom profoundly, that no improvement could be made in the knowledge of its true nature, of the best manner of arranging it, or even of the purposes to which it might be applied, unless the philosophy of the subject was investigated; and this became daily more apparent as the materials collected by botanical travellers accumulated. It was found that the few thousand ill-examined plants which inhabit Europe, gave a most imperfect idea of the vegetation of the globe; that methods of classification which were tolerable so long as species were few, became useless, or an incumbrance, as the number increased, and that no real progress in Botany, as a branch of science, could be hoped for, so long as a few arbitrary signs were taken as the basis of all arrangement. The older Botanists knew little of vegetable physiology; and of the laws of vegetable structure they had, at the most, but a glimmering perception. Yet those subjects are the foundation of all sound principles of classification. The recognition of that fact immediately led to the investigation of new branches of knowledge, in which discoveries were daily made, and it has terminated in a universal adoption of the principles of Ray, improved and

extended by the admirable views of Jussieu, as developed in his *Genera Plantarum secundum Ordines Naturales disposita*—a book of wonderful sagacity and most profound research.

Since the appearance of that work, Botany has assumed a new position in the ranks of science, and the evidence from which conclusions are to be drawn has multiplied beyond all that could have been anticipated. Twenty thousand species, at the utmost, could have been known to Jussieu, in 1789; we have seen that the number actually on record at the present day amounts to more than 92,000. Vegetable Anatomy, the foundation of Vegetable Physiology, was at the former period in the state in which it had been left by Grew and Malpighi; it has since engaged the attention of the most acute and indefatigable observers, now armed with optical instruments of surprising excellence. The resources of Chemistry and Natural Philosophy have been enlisted in its cause; and the result is the accumulation of a prodigious mass of facts, the best mode of arranging which is the great problem that modern science has to solve.

That no artificial mode of classifying the vast materials of Botany could satisfy the human mind, was clearly perceived and fully admitted by Linneus himself, when he declared a Natural System to be the *primum et ultimum in botanicis desideratum*, (Phil. Bot., § 77.) That no insuperable obstacle to its attainment could exist in the nature of things, became evident the moment that the work of Jussieu was before the world. The Botanist for the first time proposed distinctive characters for the groups of genera, which he called Natural Orders, and those characters were framed with such skill that a large proportion of his distinctions is still unaffected by the progress of modern discovery.

The Natural Orders thus obtained were bound together into a system, by adopting the important distinctions of acotyledons, monocotyledons and dicotyledons, and then by subdividing the two latter into classes mainly characterized by the insertion of the stamens, or the condition of the corolla.

It was not, however, to be expected that the views of Jussieu should be just in all respects, or that his scanty materials would enable him to form a plan of classification sound and perfect in all its parts. On the contrary, his system abounded in errors and imperfections, and, in fact, the latter years of his life were occupied in striving to improve and consolidate it. The same object has been sought by great numbers of those who have succeeded him, and every few years, of late, have witnessed the production of some scheme of classification which, although founded essentially upon the groundwork of Jussieu, differed, nevertheless, in numerous details. In another place, the principal of these schemes will be mentioned. It will be, for the present, sufficient to say, that, beginning with Brown, in 1810, and ending with Adolphe Brongniart, in 1843, the mass of suggestions and improvements which has been collected, renders comparatively easy the task of applying Jussieu's principles of classification to the vast multitudes of species now forming the Vegetable Kingdom.

The true principles of classification, however much they may have been amplified and refined upon, were in reality expressed by Ray, when he defined a Natural System to be that *which neither brings together dissimilar species, nor separates those which are nearly allied.* However much the words of this definition may have been varied, it still retains the very meaning given to it by its author. *A species*, said Jussieu, *consists of individuals very much alike in all their parts, and retaining their resemblances from generation to generation. Those species are to be associated, which correspond in the greater number of their characters; but one constant is of more importance than several inconstant characters. On these two axioms hangs the whole principle of Natural classification.* And then he proceeded to show how a group of species combined upon this principle forms a Genus, of Genera an Order, and of Orders a Class; the same rules of combination being observed throughout, with this difference only, that the

larger the group the fewer the characters by which it is limited.

But it is far more easy to lay down principles than to put them in execution. The definition of Ray is perfect, but its application is surrounded with difficulty. The very first point to settle, in attempting to carry out his views, is, by what rule the dissimilarity or alliance of species is to be determined. In fact, very different ideas of likeness or unlikeness are entertained by different observers. The common people can see no difference of moment between a daphne, and a cherry, and a rhododendron, but call them all laurels, although a Botanist fails to perceive their resemblance. On the other hand, there seems, to the vulgar eye, no connection between the hemp plant and the mulberry tree, and yet the Botanist brings them into close alliance. Nor are these conflicting views confined to the ignorant and the uneducated ; such differences of opinion may be found among Botanists themselves. For instance, Linneus joined arum with phytolacca, under his Piperitæ ; and convolvulus with viola, under his Campanacæ—combinations which modern Botanists entirely repudiate : and, in like manner, the association of hugonia with chlenads, by Endlicher ; of nepenthes with birthworts, by Brown ; of planes with witch hazels, by Adolphe Brongniart ; of vines with berberries, by the author of this work ; of spurgeworts with heathworts and chenopods, by Fries, are so many modern instances of peculiar views from which other Botanists withhold their assent.

It is, therefore, of the first importance to settle, with something like precision, what it is that constitutes likeness among plants, or, as it is technically called, their affinity.

The reason why the vulgar commit mistakes in judging of natural affinity is, because they draw their conclusions from unimportant circumstances, the chief of which are size, form and color. The similitude of size gave rise to the old notion that all trees made a class by themselves ; which is as if, in a classification of animals, the horse, the lion and elephant,

were placed in a different part of the animal kingdom from the rat, the cat and the goat. Form is another of the false guides which lead to error; if all round-leaved or square-stemmed plants are to be associated, so ought glass to be classed with the diamond, when it is cut to the same shape. Color is less a source of mistake, and yet it is sometimes unconsciously employed by the superficial observer, as when he calls all yellow-flowered composites, marigolds, and all white-flowered vernal bushes, thorns. It must be evident to the most careless thinker, that such resemblances are trifling.

That which really determines affinity, is correspondence in structure. It may be said that those plants are most nearly related which correspond in the greatest number of points, and those the most distantly in which we find the fewest points of correspondence; and this must be true, when we remember that if every point in the structure of any two plants is found to be alike, then those two must be identical. But it will be obvious that an examination of all plants, through every detail of their organization, is impracticable; it has never, in fact, been accomplished in any one case. Experience must have shown that the organs of vegetation are of very different degrees of value in determining resemblance in structure, that some are of paramount importance, others of less consequence, and others of comparative insignificance. Hence the relative value of characters forms a most important part of the study of the Botanist; it is, in fact, the pivot upon which all the operations of a systematist must turn.

The only intelligible principle by which to estimate their respective value is according to their known physiological importance; regarding those organs of the highest rank which are most essential to the life of the plant itself; placing next in order those with which the plant cannot dispense, if its race is to be preserved; assigning a still lower station to such organs as may be absent without considerable

disturbance of the ordinary functions of life; and fixing at the bottom of the scale, those parts, or modifications of parts, which may be regarded as accessory, or quite unconnected with obviously important functions.

The first office which all organized beings have to perform, is that of feeding; for it is thus only that their existence is maintained. The second is that of propagating, by means of which their species is perpetuated. These being functions of the highest importance, it is reasonable to conclude that the organs provided for their proper execution must be of the highest importance also, and hence that they are beyond all others valuable for the purposes of classification. And, again, because the power of feeding must come before that of propagating, it might be conjectured beforehand, that the organs destined for the former operation would afford the first elements of a Natural method. But since the action of feeding is very simple in the Vegetable Kingdom, because of the similar modes of life observable among plants, while, on the contrary, the act of propagation is highly diversified, on account on the very varied nature or structure of the parts by which it is accomplished, so might we conjecture that the organs of nutrition would afford but few distinctions available for purposes of classification, while those of fructification would furnish many. And such is the fact. Hence it is that the great classes of plants are principally distinguished by their organs of growth, and that in the numerous minor groups such peculiarities are comparatively disregarded, their chief distinctions being derived from their parts of reproduction. These principles are more fully expressed in the following axioms:—

1. Peculiarities of structure which are connected with the manner in which a plant is developed, are *physiological;* those which are connected with the manner in which parts are arranged, are *structural.* Physiological characters are of two kinds, viz., those which are connected with the *mode of growth (the organs of vegetation)* and those which regulate *repro-*

duction (the organs of fructification.) Physiological characters are of greater importance in regulating the natural classification of plants than structural.

2. All modifications of either are respectively important, in proportion to their connection with the phenomena of life.

3. If we allow ourselves to be steadily guided by these considerations, we shall find that the internal or anatomical structure of the axis, and of the foliage, is of more importance than any other character; because these are the circumstances which essentially regulate the functions of growth and the very existence of an individual.

4. That next in order is the internal structure of the seed, by which the species must be multiplied. Thus the presence of an embryo, or its absence—the first indicating a true seed, the latter a spore—are most essential circumstances to consider. And so also the existence of albumen in abundance round the embryo, or its absence, must be regarded as a physiological character of the highest value: because, in the former case, the embryo demands a special external provision for its early nutriment, as in oviparous animals; while, in the latter case, the embryo is capable of developing by means of the powers resident in itself, and unassisted, as in viviparous animals.

5. Next to this, must be taken the structure of the organs of fructification, by whose united action the seed is engendered; for without some certain, uniform and invariable action on their part, the race of a plant must become extinct. Thus we find that the structure of the anthers, placentæ and ovules, are more uniform than that of the parts surrounding them, while their numbers are variable; and the condition of the filament, which appears of so little importance in a physiological point of view, is also inconstant. So also the texture and surface and form of the pericarp, which acts as a mere covering to the seeds, is not to be regarded in these inquiries, and, in fact, differs from genus to genus; as, for

instance, between Pyrus and Stranvæsia, or Rubus and Spiræa, in the truly natural Rosaceous Order.

6. On the other hand, the floral envelopes seem to be unconnected with functions of a high order, and to be designed rather for the decoration of plants, or for the purpose of giving variety to the aspect of the vegetable world; and, consequently, their number, form and condition, presence or absence, regularity or irregularity, are of low and doubtful value, except for specific distinction. There seems, indeed, reason to expect that every Natural Order will, sooner or later, be found to contain within itself all the variations above alluded to. Even in the cases of regularity and irregularity we already know this to be so; witness Veronica and Scoparia in figworts, and Hyoscyamus in nightshades, Delphinium in crowfoots, and Pelargonium in cranesbills.

7. The consolidation of the parts of fructification is a circumstance but little attended to, in a general point of view, except in respect to the corolla; but as it seems to indicate either the greatest change that the parts can undergo, or, where it occurs between important and usually unimportant organs, that in such cases the latter become essential to the former, it probably deserves to be regarded with great attention. For instance, the presence or absence of the corolla is often a point of little moment, and is, we know, a very fluctuating circumstance. This is especially true of those Natural Orders in which the stamens and petals are separated; as in roseworts, rhamnads, onagrads, &c. On the other hand, when the stamens, which are indispensable organs, adhere to the petals, the latter are more constantly present, as in figworts, acanthads, nightshades, &c.

There are also certain other principles which experience tells us the systematist must keep in view; and most especially that of regarding of importance whatever appears to be constant in its nature among nearly allied species. Nothing which is thus constant can be considered unimportant, for everything constant is dependent upon or connected with

some essential function. Therefore all constant characters, of whatever nature, require to be taken into account, in classifying plants according to their natural affinities. Of this nature are the internal structure of stems and leaves, the anatomical condition of tissue, the organization of the anther, pollen and female apparatus, and the interior of the seed.

On the other hand, whatever points of structure are variable in the same species, or in species nearly allied to each other, or in neighboring genera, are unessential to the vital functions, and should be set aside, or be regarded as of comparative unimportance. Hence the badness of the monopetalous, polypetalous and apetalous divisions of Jussieu, depending upon the mere presence or absence, and union or disunion of petals. The genus Fuchsia, for example, has petals highly developed; but in F. excorticata they are absent, and yet the plant differs no otherwise from the rest of the genus : the same is true of species of rhamnus. Again, the rue has the petals separate; and correa, very nearly allied to it, has them combined.

All classifications in which the foregoing principles are observed are natural; and that will be the most stable in which they are employed with the greatest skill. Some writers, indeed, maintain that there cannot be more than one really natural system, any more than one planetary system; and in a certain sense this may be true, inasmuch as we must suppose that one plan only has been observed in the creation of living things, and that a natural system is the expression of that plan. But, on the other hand, it must not be forgotten that such a plan may be represented in many ways; and that although the order of nature is in itself settled and invariable, yet that human descriptions of it will vary with the mind of the describer. A universal history is a collection of events; but it is not necessary that all universal histories should follow the same order of narration. The events themselves are unalterable, but the way of combining them and causing them to illustrate each other is manifold.

In natural science, indeed, the mode of arranging the matter is susceptible of infinitely more variation than history; because in the latter subject time is an inflexible leader, who cannot be lost sight of. But in natural science there is no beginning and no end. It is impossible, from the nature of things, that any arrangement should exist which shall represent the natural relations of plants in a consecutive series. It is generally admitted by those who have turned their attention to a consideration of the manner in which organized beings are related to each other, that each species is allied to others in different degrees, and that such relationship is best expressed by rays (called affinities) proceeding from a common centre, (the species.) In like manner, in studying the mutual relationship of the several parts of the Vegetable Kingdom, the same form of distribution constantly forces itself upon the mind; Genera and Orders being found to be apparently the centre of spheres, whose surface is only determined by the points where the last traces of affinity disappear. But although the mind may conceive such a distribution of organized beings, it is impossible that it should be so presented to the eye; and all attempts at effecting that object must, of necessity, fail. If, in describing the surface of a sphere, we are compelled to travel in various directions, continually returning back to the point from which we started; and if, in presenting it to the eye at one glance, we are compelled to project it upon a plane, the effect of which is to separate to the greatest distance some objects which naturally touch each other; how much more impossible must it be to follow the juxtaposition of matter, in treating of the solid contents of a sphere!

An arrangement, then, which shall be so absolutely correct an expression of the plan of nature as to justify its being called *the* Natural System, is a chimera.* All that the natu-

* Systema illud naturæ ipsius absolutum (quod mera empiria captant!) mens humana capere non potest; est quoddam supra naturale cujus clavem, manibus v. ingenio humano non prensandam, summus tantum tenet Naturæ auctor.—*Fries Corpus Florarum*, p. xvii.

ralist can do, is to carry into effect the principles above explained, with a greater or less amount of skill; the result of which will be *a* Natural System.

When Linneus attempted to form a Natural System, he merely threw together such genera as he knew, into 67 groups, which he called Fragments, and which were equivalent to the Natural Orders of modern Botany. Jussieu advanced a step further, by forming 15 Classes, under which he placed 100 Natural Orders. At a later period the name Class was reserved for the three great divisions of acotyledons, monocotyledons and dicotyledons; and the Orders were collected into smaller groups, called Sub-classes; and thus, by degrees, the necessity of forming three grades of distinctive characters superior to genera was recognized. Dr. Robert Brown, whose sagacity is not the least remarkable part of his scientific character, long ago pointed out the insufficiency of even this amount of subdivision, and proposed the combination of Natural Orders into groups intermediate between orders and sub-classes. The necessity of this measure is now universally acknowledged; attempts have been made for some years, by various Botanists, to work out the problem; and it must be conceded that a real advance has thus been made, by the efforts of various independent observers, to the accomplishment of so very desirable an object.

It may be, and certainly is, in some measure, true, that insuperable difficulties are, in the present state of our knowledge, opposed to strict definitions of Natural Orders, and, *à fortiori*, of their Alliances, &c. But that is no reason why we should not endeavor to render their distinctive characters as precise as the nature of the subject will permit. Vague distinctions, which are at once the bane and opprobrium of Natural History, are so repulsive to the understanding as to deter the mass of mankind from giving it their attentive study. And it is not too much to assert that this vagueness arises more frequently out of the prejudices or

mistiness of the Naturalist's own mind, than out of things themselves. It will constantly happen that two groups may stand, by common consent, in the nearest conceivable relation to each other; it is quite possible, by one way of arranging them, to render their distinctions nugatory, and by another, clear and precise. Now, if the supposed groups are really as closely allied, as for this argument we may suppose them to be, it can be of no possible importance, theoretically, whether a given Genus or Order is placed in the one or the other. The near consanguinity of the two, does away with all importance in such a case. In Physical Geography it is of no consequence whether London is stationed in Middlesex or Surrey; and, in like manner, in Theoretical Botany, the place of a given Order may be equally indifferent. But it may be of great consequence practically, because a definition of limits may be possible or not, according to the arrangement. For example, let us take the Solanal and Bignonial Alliances. These touch at the Orders of nightshades and figworts respectively. If nightshades are placed in the Bignonial Alliance, because of their intimate relation to figworts, no apparent means remain of clearly defining what is meant by the Bignonial Alliance. If, on the other hand, figworts are stationed in the Solanal Alliance, then the distinctive characters of that alliance are also rendered obscure and difficult, or impossible of application. But place nightshades in the Solanal, and figworts in the Bignonial Alliance, and the language of Botanists affords as clear a discrimination as can be wished for. And so of other cases. Indeed, I am so persuaded of this, that, in my opinion, all instances of confused and vague characters are only so many proofs of Botanists not having clearly understood the plants that they have endeavored to classify.

It will, perhaps, be alleged that the doctrine just inculcated is directly opposed to the first principles of a Natural System: but such is not the case. No absolute limits, in fact, exist, by which groups of plants can be circumscribed. They pass

into each other by insensible gradations, and every group has apparently some species which assumes in part the structure of some other group. Two countries are separated by a river whose waters are common to both banks; in a geographical division of territory, the river may be assigned to either the left bank or the right bank, but such an arrangement is arbitrary; and yet the interior of the countries is unaffected by it. So with the groups of plants; it cannot be of any possible consequence whether an intermediate or frontier plant be assigned to one group or another, and convenience alone should be considered in such a matter. This, long since, led to the following observations, the justice of which much more experience entirely confirms:—"All the groups into which plants are thrown, are in one sense artificial, inasmuch as Nature recognizes no such groups. Nevertheless, consisting in all cases of species very closely allied in nature, they are in another sense natural. But as the Classes, Sub-Classes, Alliances, Natural Orders and Genera of Botanists have no real existence in nature, it follows that they have no fixed limits, and consequently, that it is impossible to define them. They are to be considered as nothing more than the expression of particular *tendencies* (nixus) on the part of the plants they comprehend, to assume a particular mode of development. Their characters are only a declaration of their prevailing tendencies."

ESTIMATED NUMBER OF GENERA AND SPECIES

IN

THE VEGETABLE KINGDOM,

AS FAR AS IS AT PRESENT KNOWN.

	Gen	Sp.		
Class I. THALLOGENS.				
Alliance I. *Algales.*				
Order 1. Diatomaceæ, 12	45	457		
— 2. Confervaceæ, 14	66	368		
— 3. Fucaceæ, 20	81	452		
— 4. Ceramiaceæ, 23	88	682		
— 5. Characeæ, 26	3	35	283	1994
Alliance II. *Fungales.*				
Order 6. Agaricaceæ,				
— 7. Lycoperdaceæ,				
— 8. Uredinaceæ, } 41			598	4000
— 9. Botrytaceæ,				
— 10. Helvellaceæ,				
— 11. Mucoraceæ,				
Alliance III. *Lichenales.*				
Order 12. Graphidaceæ,				
— 13. Collemaceæ, } 50			58	2400
— 14. Parmeliaceæ,				
Total, - - - -	·		939	8394
Class II. ACROGENS.				
Alliance IV. *Muscales.*				
Order 15. Ricciaceæ, 57	8	29		
— 16. Marchantiaceæ, 58	15	20		
— 17. Jungermanniaceæ, 59	42	650		
— 18. Equisetaceæ, 61	1	10		
— 19. Andræaceæ, 63	2	13		
— 20. Bryaceæ, 64	44	1100	113	1822
Alliance V. *Lycopodales.*				
Order 21. Lycopodiaceæ, 69	1	200		
— 22. Marsileaceæ, 71	5	24	6	224
Alliance VI. *Filicales.*				
Order 23. Ophioglossaceæ, 77	4	25		
— 24. Polypodiaceæ, 78	183	2000		
— 25. Danæaceæ, 82	5	15	192	2040
Total, - - - -	-	-	310	4086
Class III. RHIZOGENS.				
Order 26. Balanophoraceæ, 89	12	30		
— 27. Cytinaceæ, 91	4	7		
— 28. Rafflesiaceæ, 93	6	16	21	53
Total, - - - -	·	-	21	53
Class IV. ENDOGENS.				
Alliance VII. *Glumales.*				
Order 29. Graminaceæ, 106	291	3800		
— 30. Cyperaceæ, 117	112	2000		
— 31. Desvauxiaceæ, 120	4	15		
— 32. Restiaceæ, 121	23	171		
— 33. Eriocaulaceæ, 122	9	200	439	6186

	Gen	Sp.		
Alliance VIII. *Arales.*				
Order 34. Pistiaceæ, 124	6	20		
— 35. Typhaceæ, 126	2	13		
— 36. Araceæ, 127	26	170		
— 37. Pandanaceæ, 130	7	75	41	278
Alliance IX. *Palmales.*				
Order 38. Palmaceæ, 134	73	400	73	400
Alliance X. *Hydrales.*				
Order 39. Hydrocharidaceæ, 141	12	20		
— 40. Naiadaceæ, 143	9	16		
— 41. Zosteraceæ, 145	6	12	26	48
Alliance XI. *Narcissales.*				
Order 42. Bromeliaceæ, 147	23	170		
— 43. Taccaceæ, 149	2	8		
— 44. Hæmodoraceæ, 151	13	50		
— 45. Hypoxidaceæ, 154	4	60		
— 46. Amaryllidaceæ, 155	68	400		
— 47. Iridaceæ, 159	53	550	163	1238
Alliance XII. *Amomales.*				
Order 48. Musaceæ, 163	4	20		
— 49. Zingiberaceæ, 165	29	247		
— 50. Marantaceæ, 168	6	160	39	427
Alliance XIII. *Orchidales.*				
Order 51. Burmanniaceæ, 171	7	30		
— 52. Orchidaceæ, 173	394	3000		
— 53. Apostasiaceæ, 184	3	5	404	3035
Alliance XIV. *Xyridales.*				
Order 54. Philydraceæ, 186	2	2		
— 55. Xyridaceæ, 187	5	70		
— 56. Commelynaceæ, 188	16	260		
— 57. Mayaceæ, 189	1	4	24	336
Alliance XV. *Juncales.*				
Order 58. Juncaceæ, 191	13	200		
— 59. Orontiaceæ, 193	13	70	26	270
Alliance XVI. *Liliales.*				
Order 60. Gilliesiaceæ, 196	2	6		
— 61. Melanthaceæ, 198	30	130		
— 62. Liliaceæ, 200	133	1200		
— 63. Pontederaceæ, 206	6	30	171	1365
Alliance XVII. *Alismales.*				
Order 64. Butomaceæ, 208	4	7		
— 65. Alismaceæ, 209	3	50		
— 66. Juncaginaceæ, 210	7	44	14	101
Total, - - -		-	1420	13684

Class V. DICTYOGENS.	Gen	Sp.		
Order 67. Triuridaceæ, 213	2	2		
— 68. Dioscoreaceæ, 214	6	110		
— 69. Smilaceæ, 215	2	120		
— 70. Philesiaceæ, 217	2	2		
— 71. Trilliaceæ, 218	4	30		
— 72. Roxburghiaceæ, 219	1	4	17	268
Total, - - - -	-	-	17	268
Class VI. GYMNOGENS.				
Order 73. Cycadaceæ, 223	6	45		
— 74. Pinaceæ, 226	20	100		
— 75. Taxaceæ, 230	9	50		
— 76. Gnetaceæ, 232	2	15	37	210
Total, - - -	-	-	37	210
Class VII. EXOGENS.				
Alliance XVIII. *Amentales.*				
Order 77. Casuarinaceæ, 249	1	20		
— 78. Betulaceæ, 251	2	65		
— 79. Altingiaceæ, 253	1	3		
— 80. Salicaceæ, 254	2	220		
— 81. Myricaceæ, 256	3	20		
— 82. Elæagnaceæ, 257	4	30	13	358
Alliance XIX. *Urticales.*				
Order 83. Stilaginaceæ, 259	3	20		
— 84. Urticaceæ, 260	23	300		
— 85. Ceratophyllaceæ, 263	1	6		
— 86. Cannabinaceæ, 265	2	2		
— 87. Moraceæ, 266	8	184		
— 88. Artocarpaceæ, 269	23	54		
— 89. Platanaceæ, 272	1	6	61	572
Alliance XX. *Euphorbiales.*				
Order 90. Euphorbiaceæ, 274	191	2500		
— — Gyrostemoneæ, 282	2	3		
— 91. Scepaceæ, 283	3	6		
— 92. Callitrichaceæ, 284	1	6		
— 93. Empetraceæ, 285	4	4		
— — Batideæ, 286	1	2		
— 94. Nepenthaceæ, 287	1	6	203	2527
Alliance XXI. *Quernales.*				
Order 95. Corylaceæ, 290	8	265		
— 96. Juglandaceæ, 292	4	27	12	292
Alliance XXII. *Garriales.*				
Order 97. Garryaceæ, 295	2	6		
— 98. Helwingiaceæ, 296	1	1	3	7
Alliance XXIII. *Menispermales.*				
Order 99. Monimiaceæ, 298	8	40		
— 100. Atherospermaceæ, 300	3	4		
— 101. Myristicaceæ, 301	5	35		
— 102. Lardizabalaceæ, 303	7	15		
— 103. Schizandraceæ, 305	5	12		
— 104. Menispermaceæ, 307	11	175	39	281
Alliance XXIV. *Cucurbitales.*				
Order 105. Cucurbitaceæ, 311	56	270		
— 106. Datiscaceæ, 316	3	4		
— 107. Begoniaceæ, 318	2	159	61	433
Alliance XXV. *Papayales.*				
Order 108. Papayaceæ, 321	8	25		
— 109. Pangiaceæ, 323	3	4	11	29
Alliance XVXI. *Violales.*				
Order 110. Flacourtiaceæ, 327	31	85		
— 111. Lacistemaceæ, 329	2	6		

	Gen	Sp.		
Order 112. Samydaceæ, 330	5	80		
— 113. Passifloraceæ, 332	12	210		
— 114. Malesherbiaceæ, 335	2	5		
— 115. Moringaceæ, 336	1	4		
— 116. Violaceæ, 338	11	300		
— 117. Frankeniaceæ, 340	4	24		
— 118. Tamaricaceæ, 341	3	43		
— 119. Sauvagesiaceæ, 343	3	15		
— 120. Crassulaceæ, 344	22	450		
— 121. Turneraceæ, 347	2	60	98	1282
Alliance XXVII. *Cistales.*				
Order 122 Cistaceæ, 349	7	185		
— 123. Brassicaceæ, 351	173	1600		
— 124. Resedaceæ, 356	6	41		
— 125. Capparidaceæ, 357	28	340	214	2166
Alliance XXVIII. *Malvales.*				
Order 126. Sterculiaceæ, 360	34	125		
— 127. Byttneriaceæ, 363	45	400		
— 128. Vivianiaceæ, 365	4	15		
— 129. Tropæolaceæ, 366	5	43		
— 130. Malvaceæ, 368	37	1000		
— 131. Tiliaceæ, 371	35	350	160	1933
Alliance XXIX. *Sapindales.*				
Order 132. Tremandraceæ, 374	3	16		
— 133. Polygalaceæ, 375	19	495		
— 134. Vochyaceæ, 379	8	51		
— 135. Staphyleaceæ, 381	3	14		
— 136. Sapindaceæ, 382	50	380		
— 137. Petiveriaceæ, 386	3	10		
— 138. Aceraceæ, 387	3	60		
— 139. Malpighiaceæ, 388	42	555		
— 140. Erythoxylaceæ, 391	1	75	132	1656
Alliance XXX. *Guttiferales.*				
Order 141 Dipteraceæ, 393	7	47		
— — Lophiraceæ, 395	1	1		
— 142. Ternstromiaceæ, 396	83	130		
— 143. Rhizobolaceæ, 398	2	8		
— 144. Clusiaceæ, 400	30	150		
— 145. Marcgraviaceæ, 403	4	26		
— 146. Hypericaceæ, 405	13	276		
— 147. Reaumuriaceæ, 407	3	4	93	642
Alliance XXXI. *Nymphales.*				
Order 148. Nymphæaceæ, 409	5	50		
— 149. Cabombaceæ, 412	2	3		
— 150. Nelumbiaceæ, 414	1	3	8	56
Alliance XXXII. *Ranales.*				
Order 151. Magnoliaceæ, 417	11	65		
— 152. Anonaceæ, 420	20	300		
— 153. Dilleniaceæ, 423	26	200		
— 154. Ranunculaceæ, 425	41	1000		
— — Cephaloteæ, 428	1	1		
— 155. Sarraceniaceæ, 429	2	7		
— 156. Papaveraceæ, 430	18	130	119	1703
Alliance XXXIII. *Berberales.*				
Order 157. Droseraceæ, 433	7	90		
— 158. Fumariaceæ, 435	15	110		
— 159. Berberidaceæ, 437	12	100		
— 160. Vitaceæ, 439	7	260		
— 161. Pittosporaceæ, 441	12	78		
— — Canellaceæ, 442	2	3		
— 162. Olacaceæ, 443	21	48		
— 163. Cyrillaceæ, 445	3	5	79	604
Alliance XXXIV. *Ericales.*				
Order 164. Humiriaceæ, 447	4	10		
— 165. Epicridaceæ, 448	30	320		
— 166. Pyrolaceæ, 450	5	20		
— 167. Francoaceæ, 451	2	5		
— 168. Monotropaceæ, 452	6	10		
— 169. Ericaceæ, 453	42	850	89	1215

	Gen	Sp.		
Alliance XXXV. *Rutales.*				
Order 170. Aurantiaceæ, 457	20	95		
— 171. Amyridaceæ, 459	22	45		
— 172. Cedrelaceæ, 461	9	25		
— 173. Meliaceæ, 463	33	150		
— 174. Anacardiaceæ, 465	41	95		
— 175. Connaraceæ, 468	5	41		
— 176. Rutaceæ, 469	47	400		
— 177. Xanthoxylaceæ, 472	20	110		
— 178. Ochnaceæ, 474	6	82		
— — Coriarieæ, 475	1	8		
— 179. Simarubaceæ, 476	10	35		
— 180. Zygophyllaceæ, 478	7	100		
— 181. Elatinaceæ, 480	6	22		
— 182. Podostemaceæ, 482	9	25	236	1233
Alliance XXXVI. *Geraniales.*				
Order 183. Linaceæ, 485	3	90		
— 184. Chlænaceæ, 486	4	8		
— 185. Oxalidaceæ, 488	6	325		
— 186. Balsaminaceæ, 490	2	110		
— 187. Geraniaceæ, 493	4	500	19	1033
Alliance XXXVII. *Silenales.*				
Order 188. Caryophyllaceæ, 498	53	1055		
— 189. Illecebraceæ, 499	24	100		
— 190. Portulacaceæ, 500	12	184		
— 191. Polygonaceæ, 502	29	490	118	1829
All. XXXVIII. *Chenopodales.*				
Order 192. Nyctaginaceæ, 506	14	100		
— 193. Phytolaccaceæ, 508	9	60		
— — Surianaceæ, 509	1	1		
— 194. Amarantaceæ, 410	38	282		
— 195. Chenopodiaceæ, 512	63	360	125	803
Alliance XXXIX. *Piperales.*				
Order 196. Piperaceæ, 515	20	600		
— 197. Chloranthaceæ, 519	3	15		
— 198. Saururaceæ, 521	4	7	27	622
Alliance XL. *Ficoidales.*				
Order 199. Bassellaceæ, 524	4	12		
— 200. Mesembryaceæ, 525	5	375		
— 201. Tetragoniaceæ, 527	11	65		
— 202. Scleranthaceæ, 528	4	14	24	466
Alliance XLI. *Daphnales.*				
Order 203. Thymelaceæ, 530	38	300		
— 204. Proteaceæ, 532	44	650		
— 205. Lauraceæ, 535	46	450		
— 206. Cassythaceæ, 538	1	9	129	1409
Alliance XLII. *Rosales.*				
Order 207. Calycanthaceæ, 540	2	6		
— 208. Chrysobalanaceæ, 542	11	50		
— 209. Fabaceæ, 544	467	6500		
— 210. Drupaceæ, 557	5	110		
— 211. Pomaceæ, 559	16	200		
— 212. Sanguisorbaceæ, 561	12	125		
— 213. Rosaceæ, 563	38	500	551	7401
Alliance XLIII. *Saxifragales.*				
Order 214. Saxifragaceæ, 567	19	310		
— 215. Hydrangeaceæ, 569	9	45		
— 216. Cunoniaceæ, 571	22	100		
— 217. Brexiaceæ, 573	4	6		
— 218. Lythraceæ 574	35	300	89	761
Alliance XLIV. *Rhamnales.*				
Order 219. Penæaceæ, 577	3	21		
— 220. Aquilariaceæ, 579	6	10		
— 221. Ulmaceæ, 580	9	60		

	Gen	Sp.		
Order 222. Rhamnaceæ, 581	42	250		
— 223. Chailletiaceæ, 583	4	10		
— 224. Hippocrateaceæ, 584	6	86		
— 225. Celastraceæ, 586	24	260		
— 226. Stackhousiaceæ, 589	2	10		
— 227. Sapotaceæ, 590	21	212		
— 228. Styracaceæ, 592	6	115	123	1034
Alliance XLV. *Gentianales.*				
Order 229. Ebenaceæ, 595	9	160		
— 230. Aquifoliaceæ, 597	11	110		
— 231. Apocynaceæ, 599	100	566		
— 232. Loganiaceæ, 602	22	162		
— — Cassipoureæ, 604	2	7		
— 233. Diapensiaceæ, 606	2	2		
— 234. Stilbaceæ, 607	3	7		
— 235. Orobanchaceæ, 609	12	116		
— 236. Gentianaceæ, 612	60	450	221	1520
Alliance XLVI. *Solanales.*				
Order 237. Oleaceæ, 616	24	130		
— 238. Solanaceæ, 618	60	900		
— 239. Asclepiadaceæ, 623	141	910		
— 240. Cordiaceæ, 628	11	180		
— 241. Convolvulaceæ, 630	43	650		
— 242. Cuscutaceæ, 633	2	50		
— 243. Polemoniaceæ, 635	17	104	298	2934
Alliance XLVII. *Cortusales.*				
Order 244. Hydrophyllaceæ, 638	16	75		
— 245. Plumbaginaceæ, 640	8	160		
— 246. Plantaginaceæ, 642	3	120		
— 247. Primulaceæ, 644	29	215		
— 248. Myrsinaceæ, 647	30	320	86	880
Alliance XLVIII. *Echiales.*				
Order 249. Jasminaceæ, 650	5	100		
— 250. Salvadoraceæ, 652	1	2		
— 251. Ehretiaceæ, 653	14	297		
— 252. Nolanaceæ, 654	6	35		
— 253. Boraginaceæ, 655	53	600		
— 254. Brunoniaceæ, 657	1	2		
— 255. Lamiaceæ, 659	125	2350		
— 256. Verbenaceæ, 663	56	610		
— 257. Myoporaceæ, 665	9	42		
— 258. Selaginaceæ, 666	10	120	280	4158
Alliance XLIX. *Bignoniales.*				
Order 259. Pedaliaceæ, 669	14	25		
— 260. Gesneraceæ, 671	54	260		
— 261. Crescentiaceæ, 673	11	34		
— 262. Bignoniaceæ, 675	44	450		
— 263. Acanthaceæ, 678	105	750		
— 264. Scrophulariaceæ, 681	176	1814		
— 265. Lentibulariaceæ, 686	4	175	408	3508
Alliance L. *Campanales.*				
Order 266. Campanulaceæ, 689	20	500		
— 267. Lobeliaceæ, 692	27	375		
— 268. Goodeniaceæ, 694	14	150		
— 269. Stylidiaceæ, 696	5	121		
— 270. Valerinaceæ, 697	12	185		
— 271. Dipsacaceæ, 699	6	150		
— 272. Calyceraceæ, 701	5	10		
— 273. Asteraceæ, 702	1005	9000	1102	10491
Alliance LI. *Myrtales.*				
Order 274. Combretaceæ, 717	22	200		
— 275. Alangiaceæ, 719	3	8		
— 276. Chamælauciaceæ, 721	15	50		
— 277. Haloragaceæ, 722	8	70		
— 278. Onagraceæ, 724	28	450		
— 279. Rhizophoraceæ, 726	5	20		
— 280. Belvisiaceæ, 728	2	4		
— 281. Melastomaceæ, 731	118	1200		
— 282. Myrtaceæ, 734	45	1300		
— 283. Lecythidaceæ, 739	7	38	253	3340

Alliance LII. *Cactales.*	Gen	Sp.		
Order 284. Homaliaceæ, 742	8	30		
— 285. Loasaceæ, 744	15	70		
— 286. Cactaceæ, 746	16	800	39	900
Alliance LIII. *Grossales.*				
Order 287. Grossulariaceæ. 750	2	95		
— 288. Escalloniaceæ, 752	7	60		
— 289. Philadelphaceæ, 753	3	25		
— 290. Barringtoniaceæ, 754	10	28	22	208
Alliance LIV. *Cinchonales.*				
Order 291. Vacciniaceæ, 757	13	200		
— 292. Collumelliaceæ, 759	1	3		
— 293. Cinchonaceæ, 761	269	2500		
— 294. Caprifoliaceæ, 766	14	220		
— 295. Galiaceæ, 768	8	320	305	3243

Alliance LV. *Umbellales.*	Gen	Sp.		
Order 296. Apiaceæ, 773	267	1500		
— 297. Araliaceæ, 780	21	160		
— 298. Cornaceæ, 782	9	40		
— 299. Hammamelidaceæ, 784	10	15		
— 300. Bruniaceæ, 785	15	65	322	1780
Alliance LVI. *Asarales.*				
Order 301. Santalaceæ, 787	18	110		
— 302. Loranthaceæ, 789	23	412		
— 303. Aristolochiaceæ, 792	8	130	49	652
Total, - - -	-	-	6191	66225

GRAND TOTAL.

		Genera.	Species.
Class I.	Thallogens, - - - - - - - - - - -	939	8394
— II.	Acrogens, - - - - - - - - - - -	310	4086
— III.	Rhizogens, - - - - - - - - - - -	21	53
— IV.	Endogens, - - - - - - - - - - -	1420	13684
— V.	Dictyogens, - - - - - - - - - - -	17	268
— VI.	Gymnogens, - - - - - - - - - - -	37	210
— VII.	Exogens, - - - - - - - - - - -	6191	66225
	Total, - - - - - - -	8935	92930

The Pimpernel.

The Anagallis Arvensis—Scarlet Pimpernel—is in the class Pentandria, order Monogynia. The generic name is derived from αναγω, to extract, or draw out, because the branches and leaves were pounded by the ancients, not only to draw forth thorns and splinters, but it was also considered of sufficient efficacy to extract the pôints of arrows and spears that were broken in the flesh. Its essential characters are: corolla, wheel-form, deeply five-cleft; stamens, hirsute; capsule, globose, opening transversely, many seeded. Specific name derived from its growing in cultivated fields. Characters: stem, procumbent; leaves, ovate, sessile, dotted beneath; corolla segments, crenate glandular

> "Of humbler growth, though brighter dyes,
> But not by rural swains less prized,
> The trailing stems allure
> Of pimpernel, whose brilliant flower
> Closes against the approaching shower,
> Warning the swain to sheltering bower,
> From humid air secure."

This beautiful little plant, says Phillips, whose sensitive flowers form the peasant's barometer, is frequently called the shepherd's weather-glass, because the corollas never expand in rainy weather, or when the air is moist; but, on the contrary, when the atmosphere is dry, and the sun shining, they display their scarlet and purple with happy effect, bespangling the earth with their bright eyes in the most agreeable manner; but which are regularly and firmly closed when Phœbus retires to the west. This is one of the wonderful instincts of vegetable nature; were it otherwise, the damps of the night air would prevent the discharge of the farina from the anthers, and this species of plant would be, consequently, lost in the link of nature's perfect chain; for, although the pimpernel is too lowly to excite much interest in man, its seed is the food of insects, who have their office to perform

towards the completion of the general harmony of the globe. The smaller kinds of birds seek this seed with great avidity; and, as it is a plant that follows cultivation, it may save much of the seed of the husbandman from the ravages of the feathered tribe.

Plants of this description are called by Linneus, *meteoric* flowers, as being regulated by atmospheric causes. This susceptibility is by no means peculiar to the pimpernel; but is perhaps one of the most familiar examples of it. Probably its blooming during those months when the atmosphere is of the most consequence to agricultural pursuits, may make it more consulted by the husbandman. Linneus made a list of flowers, called the Dial of Flora, which told the time by their opening and closing as accurately as a clock would. Mr. Loudon has given a similar list, which we copy, for the sake of inducing some of our readers to follow his example:—

DIAL OF FLOWERS.

TIME OF OPENING.

		H.	M.
Yellow Goat's Beard,	* T.P.	3	5
Late-flowering Dandelion,	Leon.S.	4	0
Bristly Helminthia,	H.E.	4	5
Alpine Borkhausia,	B.A.	4	5
Wild Succory,	C.I.	4	5
Naked-stalked Poppy,	P.N.	5	0
Copper-colored Day Lily,	H.F.	5	0
Smooth Sow Thistle,	S.L.	5	0
Alpine Agathyrsus,	Aga.A.	5	0
Small Bindweed,	Con.A.	5	6
Common Nipplewort,	L.C.	5	6
Common Dandelion,	L.T.	5	6
Spotted Achyrophorus,	A.M.	6	7
White Water Lily,	N.A.	7	0
Garden Lettuce,	Lac.S.	7	0
African Marigold,	T.E.	7	0
Common Pimpernel,	A.A.	7	8
Mouse-ear Hawkweed,	H.P.	8	0
Proliferous Pink,	D.P.	8	0

* These are the initial letters of the Latin names of the plants; they will be found at length on the next page.

Field Marigold.	Cal.A.	9	0
Purple Sandwort,	A.P.	9	10
Small Purslane,	P.O.	9	10
Creeping Mallow,	M.C.	9	10
Chickweed,	S.M.	9	10

TIME OF CLOSING.

		H.	M.
Helminthia Echioides,	B.H. *	12	0
Agathyrsus Alpinus,	A.A.	12	0
Borkhausia Alpina,	A.B.	12	1
Leontodon Serotinus,	L.D.	12	0
Malva Caroliniana,	C.M.	12	1
Dianthus Prolifer,	P.P.	1	0
Hieracium Pilosella,	M.H.	2	0
Anagallis Arvensis,	C.P.	2	3
Arenaria Purpurea,	P.S.	2	3
Calendula Arvensis,	F.M.	3	0
Tagetes Erecta,	A.M.	3	4
Convolvulus Arvensis,	S.B.	4	5
Achyrophorus Maculatus,	S.A.	4	5
Nymphæa Alba,	W.W.L.	5	0
Papaver Nudicaule,	N.P.	7	0
Hemerocallis Fulva,	C.D.L.	7	8
Cichorium Intybus,	W.S.	8	9
Leontodon Taraxacum,	C.D.	8	9
Tragopogon Pratensis,	Y.G.B.	9	10
Stellaria Media,	C.	9	10
Lapsana Communis,	C.N.	10	0
Lactuca Sativa,	G.L.	10	0
Sonchus Lævis,	S.S.T.	11	12
Portulaca Oleracea,	S.P.	11	12

See hieracium's various tribe
Of plumy seed and radiate flowers,
The blooms of time their course describe,
And wake and sleep appointed hours.

Broad o'er its imbricated cap
The goat's-beard spreads its golden rays,
But shuts its cautious petals up,
Retreating from the noontide blaze.

Pale as a pensive, cloistered nun,
The Bethlehem-star her face unveils,
When o'er the mountain peers the sun,
But shades it from the vesper gales.

Among the loose and arid sands
The humble arenaria creeps;

* The time here stated is from noon to night.

Slowly the purple star expands,
  But soon within its calyx sleeps.

And those small bells, so lightly rayed
  With young Aurora's rosy hue,
Are to the noontide sun displayed,
  But shut their plants against the dew.

On upland slopes the shepherds mark
  The hour when, as the dial true,
Chiconium to the towering lark
  Lifts her soft eyes, serenely blue.

And thou, "wee crimson-tipped flower,"
  Gatherest thy fringed mantle round
Thy bosom at the closing hour,
  When night-drops bathe the turfy ground.

Unlike Silené, who declines
  The garish noontide's blazing light;
But, when the evening crescent shines,
  Gives all her sweetness to the night.

Thus in each flower and simple bell,
  That in our path untrodden lie,
Are sweet remembrances, which tell
  How fast their winged moments fly.

SMITH.

The following beautiful lines are by Mrs. Hemans. They celebrate the far-famed dial of flowers constructed by Linneus :—

'Twas a lovely thought, to mark the hours,
  As they floated in light away,
By the opening and the folding flowers,
  That laugh to the summer's day.

Thus had each moment its own rich hue,
  And its graceful cup and bell,
In whose colored vase might sleep the dew,
  Like a pearl in an ocean-shell.

To such sweet signs might the time have flowed
  In a golden current on,
Ere from the garden, man's first abode,
  The glorious guests were gone.

So might the days have been brightly told—
  Those days of song and dreams—
When shepherds gathered their flocks of old
  By the blue Arcadian streams.

So in those isles of delight, that rest
Far off in a breezeless main,
Which many a bark, with a weary quest
Has sought, but still in vain.

Yet is not life, in its real flight,
Marked thus—even thus—on earth,
By the closing of one hope's delight,
And another's gentle birth?

Oh! let us live, so that flower by flower,
Shutting in turn, may leave
A lingerer still for the sunset hour,
A charm for the shaded eve.

The common pimpernel continues to give out a succession of blossoms during the summer months; and is well deserving a place in the garden, not only from this circumstance, which is no slight recommendation, but also from the beauty of its fine yellow scarlet flowers, which have a purple circle at the eye, adding much to the effect. This little plant, whose numerous square-stemmed branches, rarely rising six inches in height, are too weak to erect their flower stalks, but which catch the attention by the vivid scarlet of the corolla, was once in high repute, as its name shows, among medical practitioners, but is now entirely neglected, probably because we possess other and better remedies.

The blue-flowered pimpernel, a variety of this, is not unfrequently met with; its petals have a spot of carmine at the base of each, in the same manner as the scarlet kind is marked by the purple.

The French call this plant *Mouron*, and the English name of pimpernel seems derived from *Primpernelle*, the French name for Burnet. In floral language, it is made the emblem of ASSIGNATION.

The pimpernel is propagated by sowing the seeds soon after they are ripe, on a border of light earth. The blue-flowered, which shows very prettily on the small parterré, or on the banks or borders of the larger pleasure garden, may be increased readily by cuttings; and when planted in

a pot of light earth, and placed in a hot-bed, it will produce flowers in six weeks.

Up and abroad—the earth puts on
  Her beautiful array,
The heavens their glory, for the sun
  Rejoiceth on his way.
Not vainly shall he shed his ray:
  Yon mountain's height I'll brave,
Or trim my skiff, so light and gay,
  And wake the slumbering wave.
Hark! how the fresh breeze bears along
To heaven, wide nature's matin song.

But what is here? The pimpernel,
  Drooping with close-shut eye—
True sign, so village sages tell,
  Of storm and tempest nigh—
But sure such bright and glorious sky
  Shall know no cloud to-day;
O, then, thy darkling prophecy
  Give to the winds away,
And own, whilst thou yon heavens dost view,
For once thou hast not read them true.

Despite my taunt, the prescient flower,
  Still closed its petals bright,
And soon the storm, with voice of power,
  Show'd its forebodings right.
'Tis ever thus—some sudden blight,
  When most we dream of joy,
Does on the shining prospect light,
  To mar it, and destroy.
Oh! when, like this poor flower, shall I
Discern aright life's changing sky?

Myrtle.

The Myrtus Communis—Common Myrtle—is in the class Icosandria, order Monogynia. Its generic name is derived from μυρον, perfume. The essential characters are: calyx, superior; petals, five; berry, two or three-celled, many seeded. Specific characters: flowers, solitary; invo-

lucre, two-leaved ; leaves, ovate. It is the type of the natural order Myrtaceæ, or myrtle tribe.

> "As in the hollow breast of Appenine,
> Beneath the shelter of encircling hills,
> The myrtle rises, far from human eye,
> And breathes its balmy fragrance o'er the wild."

> "I will plant in the wilderness the myrtle." ISAIAH xii. 19.

This beautiful evergreen is a native of Southern Europe and the East. It grows most luxuriantly in Judea, where, at the present time, groves of spontaneous growth are still found. The Jews were directed to gather branches of it to adorn their booths and tents at the feast of tabernacles. The sacred writers frequently use it in contrast with the worthless brier, to image the brightness and prosperity of the true Church.

As might be expected, when transplanted from the sunny warmth of its native home, it is a tender plant in our cold climate ; and we can only see it in the conservatory, where the surpassing beauty of its leaves, fragrant alike with the snowy flowers, places it among the first of our rarest exotics. The little dots which may be perceived in the leaves when held up to the light, are glands for secreting the essential oil. Florists consider the Roman, or broad-leaved, the broad-leaved Dutch, the narrow-leaved, and the double-flowered, to be the most handsome varieties. They will all grow in any soil mixed with loam. We are told that they are propagated with most facility by cuttings of the current year's wood, when it is just beginning to ripen, cut across at a joint, and then planted in sand, and covered with a bell glass. Cuttings will root, taken off at any season and treated with common care. When made of the old wood, they should be planted to the depth of half the space between the buds ; they may also be raised from seeds, which are produced freely by the broad-leaved kinds. We are told by an English writer, that although not indigenous in his country, they will bear, without injury, the milder

climate of Devonshire and Cornwall. At Nettlesworth, in Somersetshire, there are large trees, covered with flowers. In most parts of Ireland, it is quite hardy, garden hedges of it being made at Belfast and Cork. It is supposed, by some, to have been brought to England by Sir Walter Raleigh, in 1585, after his residenee in Spain. Others assign a later date to its introduction; but Evelyn supports the former notion, by stating that, in 1678, he knew of a myrtle near eighty years old, which had been eontinually exposed, unless, during very sharp seasons, a little straw had been thrown upon it.

Though a low, warm, but well watered situation best suits the plant, yet it is mentioned by travellers as growing on lofty heights. Tournefort tells us it may be seen adorning Mount Athos with its snowy blossoms and unwithering leaf; and Hasselquist found it on Mount Tabor. It is also often observed blooming among roeks; and its delieate beauty, when eontrasted with the ruggedness of its abode, seems to acquire an additional eharm.

"And where a dark rock rose behind,
(Their shelter from the northern wind,)
Grew myrtles, with their fragrant leaves,
Veil'd with the web the gossamer weaves.
So pearly fair, so light, so frail,
Like beauty's self, more than her veil."

The oak, says Aimié Martin, has ever been eonseerated to Jupiter; the laurel, to Apollo; the olive, to Minerva; and the myrtle, to Venus. Among the ancients the myrtle was a great favorite, for its eleganee and its sweet and glossy evergreen foliage. Its perfumed and delicate flowers seem destined to adorn the fair forehead of Love, and are said to have been the emblem of Love, and dedicated to Beauty, when Venus first sprang from the sea. Mythological writers say, that when the fair goddess first appeared upon the waves, she was preeeded by the houries, with a scarf of a thousand colors and a garland of myrtle.

Wordsworth appropriates myrtle-wreaths to youthful heads, and conjures them to drop from those of declining years.

> Fall, rosy garlands, from my head!
> Ye myrtle wreaths, your fragrance shed
> Around a younger brow!

Hartley Coleridge, in a paraphrase on Horace, thus introduces the myrtle, as a fit decoration for the brow of youth.

> Nay, nay, my boy—'tis not for me,
> This studious pomp of Eastern luxury;
> Give me no various garlands—fine
> With linden twine;
> Nor seek, when latest lingering blows
> The solitary rose;
> Earnest, I beg—add not with toilsome pain,
> One far-sought blossom to the myrtle plain;
> For sure the fragrant myrtle bough,
> Looks seemliest on thy brow;
> Nor me misseems, while underneath the vine
> Close interweaved, I quaff the rosy wine.

At Rome, the first temple dedicated to Venus was surrounded by groves of myrtle; and after the victory that goddess achieved over Pallas and Juno, she was crowned with myrtles, by cupids. She avenged herself with myrtle branches on the audacious Psyche, who had dared to compare her own transitory graces with those of an immortal beauty. One day, when surprised going out of a bath by a troop of satyrs, she took refuge behind a myrtle bush.

Although triumphs are no longer celebrated in the Roman capitol, the Italian ladies have preserved a very lively passion for this lovely shrub, preferring its odor to that of the most precious essences, and throwing into their baths water distilled from its leaves, being persuaded that the tree of Venus is favorable to beauty. If the ancients had that idea—if the tree so consecrated to Venus, were to them the tree of love—it was from the true analogy between its power and that of love; for wherever the myrtle grows, it spreads itself around, to the exclusion of all other shrubs. So love, once master of a heart, leaves no room for any other sentiment.

Yes, take thy station here,
Thou flower so pale and fair!
That I from thee may sweetest lessons borrow;
For thou hast that to tell,
Methinks, which suiteth well
The lingering hours of languishment and sorrow.*

The cleft rock is thy home,
Yet sweetly dost thou bloom,
E'en while the threatening winds are round thee swelling;
And where's the pamper'd flower
Can richer fragrance shower
Than thou, fair blossom, from thy storm-wrought dwelling?

Say, then, though pale decay
Wear youth and health away,
Shall sighs alone this troubled breast be heaving?
Oh no! I'll bless the chain
Which to this couch of pain
Has bound me long, for 'tis of mercy's weaving.

What though I tread no more
The temple's hallow'd floor,
Whence to our God the full-voiced hymn ascendeth;
Yet may this chamber be
A blessed sanctuary,
Where, to my whisper'd praise, His ear He bendeth.

But chiefly, gentle flower,
Remind me, in the hour
When 'gainst the tempter's might my soul engages,
A rock is cleft for me,
More sure than shelters thee,
Where I may safely hide—"the Rock of Ages." †

Atamasco Lily.

The Amaryllis Atamasco—Atamasco Lily—is in the class Hexandria, order Monogynia. The generic name is derived from αμαρυσσω, to shine with splendor. The essential characters are: perianth irregular, funnel-shaped, nodding; filaments declined, arising from the orifice, unequal in propor-

* Thoughts in sickness.

† "Rock of Ages, cleft for me!"

tion and direction; seeds, flat, numerous. Specific characters: spatha, two-cleft, acute; flower, pedicelled; corolla, campanulate, subequal, nearly erect. It belongs to the Natural Order, Amaryllidaceæ, or Narcissus tribe.

This native of our southern States will often grow with us, by covering the roots in winter, in the same manner as those of the dahlia; they should be planted in a warm border, and somewhat sandy soil. From the midst of its long linear leaves, which often exceed a foot in length, springs up from the bulb the round scape, from four to seven inches in height, supporting a single large white flower, whose pinkish blossoms come out in June or July. The spatha is often colored.

Ash Tree.

There is a singular allegory, we are told, in the Edda, which states that the gods hold their courts under the shade of a miraculous ash, whose extensive branches shadow the whole surface of the earth; the top of the tree touches the heavens, and its roots descend to the regions of Pluto. An eagle constantly reposes on the tree, to observe everything, and a squirrel continually ascends and descends, to make report. Beneath its roots flow two fountains. In the one, wisdom is concealed, and in the other is found the knowledge of things to come. Three virgins are entrusted with the charge of this sacred tree, who ever remain under its branches, to refresh the tree with these salutary waters, which, on falling back into the earth, form a dew that produces honey.

The ash is in the class Polygamia, order Diœcia. The generic term is derived from φραξις, a separation, alluding to the easy separation of its annual layers into lamina, or, more properly, because of its use in forming hedges. Its essential

characters are : staminate flowers ; calyx, none, or three or four-parted ; corolla, none, or three or four-petalled. Fertile flowers; calyx and corolla, simulating the perfect; samara, two-celled, one-seeded, abortive. Often, as might be expected from its class, the flowers are perfect. Specific characters : leaflets, somewhat stalked ; lanceolate, acuminate, serrated, smooth, cuneate at base ; the branches are flat and smooth.

——Ash, far stretching his umbrageous arm. COWPER.

The towering ash is fairest in the woods. VIRGIL.

An English writer tells us that this is a tree belonging to his country, and one of the most valuable of the children of the forest. It has been known from the remotest period of history, and is very generally diffused. It agrees with a greater variety of soil and situation than perhaps any other tree producing timber of equal value ; and, differing from many others, its value is increased, rather than diminished, by the rapidity of its growth. On very poor soils, where it grows stunted, it is bitter, and soon affected by the rot ; but where the growth has been vigorous, the compact part of the several layers bears a greater proportion to the spongy, and the timber is very tough, elastic and durable. In elasticity, it is far superior to the oak, and is not so liable to be broken by a cross strain ; but it is much more fibrous, and more easily split. The ash is, by way of eminence, called the husbandman's tree, nothing being equal to it for agricultural implements, and for all sorts of poles, ladders, long handles, and other purposes, which require strength and elasticity, combined with comparative lightness.

At all ages, the growth of the ash is of value ; the thinnings of young plantations, and the suckers that spring up from the roots of grown trees, or from the stools of trees that have been cut down, are excellent for hoops, hop-poles, and every other purpose where clean, light and strong rods are wanted at a small expense. The leaves, and even the twigs, are

eaten by cattle with great avidity; the bark is useful in tanning, and the wood yields, when burnt, a considerable quantity of potash.

The drip of the ash is injurious to most other plants, and therefore, when it is planted in corn-fields, a certain portion round it is unproductive; but in marshy situations, the roots of it, which run a long way, at a considerable depth, act as under-drains. Hence the proverb, in some parts of England, "May your footfall be by the roots of an ash"—may you get a firm footing.

Such was the veneration of some of the ancients for the ash, that Hesiod derives his brazen men from it; and the Edda, or sacred book of the Northmen, which we quoted at the commencement of the article, gives the same origin to all the human race.

From one species of the ash, which grows in the mountains of Calabria, and does not attain a great size, manna is gathered. It is procured by cutting the trunk, toward the end of July, and collecting the juice which exudes.

The ash does not attain to such thickness as some of the forest trees. We have accounts of one eight feet in diameter; of another seventeen feet in girth; and a third, forty-two feet in circumference at four feet from the ground. Instances of so great dimensions are not numerous, however, and it is not desirable the ash should be left for such a growth, as trees of fewer years and inferior scantling are invariably better timber.

Gilpin, in his magnificent work on Forest Scenery, calls the oak the Hercules of the forest, and the ash the Venus. The chief characteristic of the one is strength, of the other, elegance. The ash carries its principal stem higher than the oak; its whole appearance is that of lightness, and the looseness of the leaves corresponds with the lightness of the spray. Its bloom is one of the most beautiful appearances of vegetation; it, however, drops its leaves early, and instead of contributing its tint to the many-colored foliage of the

autumnal woods, it presents wide blanks of desolated boughs. In old age, too, it loses that beauty and grandeur which the oak preserves.

Patience Dock.

The Polygonum Bistorta—Patience Dock—is in the class Octandria, order Trigynia. The generic name is derived from πολυς, many, and γονυ, knee, so called in allusion to the numerous knots in the stalks. Many of the species of the genus are called knot-grass on this account. Its essential characters are: calyx, colored, four to six-parted; achenia, triangular, enclosed in the calyx. Specific charactérs: stem, simple, with one spike; leaves ovate, waved, the radical ones tapering to a footstalk. It belongs to the natural order Polygonaceæ, or buckwheat tribe.

This plant is a native of England, perennial, and bearing a pink flower from May to September. It is mostly found in moist meadows. In Lancashire, England, it is substituted for greens, and in some parts of that country is known by the name of Easter giant, and its young shoots eaten in herb-puddings. Its name has made it the emblem of PATIENCE.

Some of the species in the Natural Order to which this plant belongs, are found in all parts of the world.

> "———— Their rise they boast,
> From India's deserts to Columbia's coast."

In point of elegance, the *Polygonum Orientale* takes precedence of all the rest. It is naturalized to our climate, and is very common in fields and gardens; it is known as the Prince's feather. It rises to a height of from six to eight, and even ten or twelve feet, with a straight stem, sending

off numerous panicled branches. The leaves are often six inches in length and three wide, ovate and sharp-pointed, hairy, and with salver-formed appendages at their base. The flowering spikes, which are of a bright red, and very large and numerous, gives the common name. It is an annual, blooming in August, and planting its seeds each successive year, in such vast numbers, as, in a little time, to overspread the garden, if not carefully watched.

Europe, says Phillips, is indebted to Tournefort, for this Eastern plant, that celebrated botanist having first noticed it growing in the Prince of Tefflis's garden, in Georgia; and he afterwards procured the seed from the garden of the monks of the three churches, near Mount Ararat, the spot on which the ark is supposed to have rested. From this circumstance, it has been made the emblem of RESTORATION.

It will repay a little care in its cultivation. Autumn is the proper time for sowing the seed, which should be thinly covered with earth. The plants raised from seed sown in the spring, seldom grow so strong or produce such fine flowers.

When the plants which are raised from the autumn sowing are transplanted in the spring, into a rich, moist soil, they frequently grow to the height of eight or ten feet, displaying the clustering branches of brilliant carmine flower-buds, from late in July to the end of autumn. To assist it to attain this height, all the lower branches should be regularly pruned off in the growing season, which gives strength to the upper part of the plant, and causes it to take a most elegant and graceful shape, the delicate lightness of which contrasts agreeably with the stiff and heavy sun-flower. This plant, from its height and size, is only calculated for the largest parterre, or to intermix in the shrubbery.

Narcissus.

The Narcissus Poeticus—Poet's Narcissus—is in the class Hexandria, order Monogynia. The generic name is derived from ναρκη, stupor, on account of its narcotic qualities. Its essential characters are: perianth, regular; nectary, or corona, of one piece, consisting, says Wood, of a whorl of united, sterile stamens, within which the fertile ones are inserted. Specific characters: scape, one-flowered; segments, piled at base, turned back; corona, expanded, flat, wheel-shaped, finely scolloped on the margin.

This favorite flower, says Phillips, has been made the emblem of egotism and self-love, from the beautiful and well-known story in Ovid, of the lovely and coy Narcissus, who was changed into this plant, for slighting the fair Echo in favor of his own shadow.

Narcissus on the grassy verdure lies;
But whilst within the crystal font he tries
To quench his heat, he feels new heats arise.
For as his own bright image he surveyed,
He fell in love with the fantastic shade,
And o'er the fair resemblance hung unmoved,
Nor knew, fond youth, it was himself he loved.

She saw him in his present misery,
Whom, 'spite of all her wrongs, she grieved to see;
She answered sadly to the lover's moan,
Sighed back his sighs, and groaned for every groan.
"Ah, youth! beloved in vain," Narcissus cries—
"Ah, youth! beloved in vain," the nymph replies.

"Farewell," says he—the parting sound scarce fell
From his faint lips, but she replied, "Farewell."
Then on the wholesome earth he gasping lies,
Till death shuts up those self-admiring eyes;
To the cold shades his flitting ghost retires,
And in the Stygian waves itself admires.

For him the Naiads and the Dryads mourn,
Whom the sad Echo answers in her turn;
And now the sister nymphs prepare his urn;
When, looking for his corpse, they only found
A rising stalk, with yellow blossoms crowned.

The Poet's Narcissus produces but one flower on a stalk, which inclines to one side, and takes a horizontal position. The corolla is of a pure white, and expands quite flat, the petals being rounded at the points. The cup, or nectary, in the centre, is very short, and fringed on the border with a bright purple circle; sometimes this flower is found with a crimson edge to the nectary, and we occasionally meet with them with two flowers issuing from one spatha.

There are many varieties of this flower, among which the double white narcissus is generally esteemed, either in the garden or when planted in pots for the house, and but few flowers are better calculated to fill the base of the saloon or ornament the epergne for the dinner table.

All the species are quite hardy, and will grow in any common garden soil: and they are all increased by offsets. The leaves should never be broken off after flowering, as that exhausts the strength of the plant. They are often placed in water with the hyacinth, late in autumn; the only precaution that need be observed, is not to place the same bulb in water two successive years.

Medical Department.

Bistort Root is one of the most powerful of the vegetable astringents. It was formerly much used in the treatment of intermittent fevers, but in this intention Peruvian bark has superseded it, and all others of its class. It is of a deep brown color on the outside and reddish within, without smell, and has a sharp astringent taste. Its general appearance, when found in the shops, is that of flattened cylindrical pieces of two or three inches in length, fibrous, wrinkled,

and much bent upon itself. Its astringent matter entirely dissolves in either water or spirits. It is now sometimes given by country practitioners either in the form of decoction or powder, the former of which is preferable. The common dose in powder is from fifteen to twenty-five grains, given three times a day. Half a gill of hot water poured on a dram of the bruised root, and allowed to stand till cool, will make three doses, or enough for one day's exhibition.

Scarlet Pimpernel, the juice of which, mixed with honey, was regarded by the ancients as a panacea for complaints of the eyes, insanity and low malignant fevers, and all other diseases relating to the head, is now seldom or never employed. Tragus pronounced it a remedy for the plague, and it is said to be invaluable in the early stages of consumption. Externally, the juice or decoction is recommended for cleansing foul ulcers. Orfila proved that it was not inactive, for he killed a dog with three drams of the extract, and found, on opening it, inflammation of the bowels. We are told by Pliny, that sheep eat the scarlet variety readily, but refuse utterly the blue.

Poplar Bark is possessed of tonic properties, especially that of the Amerioan Aspen. Braconnot found in it *salacine*—a peculiar principle, resembling in properties *quinine*, and for which it may be advantageously substituted. The dose of the bark varies from twenty grains and upwards, administered several times a day, between the stages of fever.

Ten-week Stock.—Camellia.

Mathiola Annua—Ten-week Stock—is in the class Tetradynamia, order Siliquosa. It is generically distinguished by the roundish silique, converging stigmas, horned at their backs, and the double, sack-like form of the base of the calyx. It is characterized specifically by the straight-branched stem, the blunt, hoary, spear-shaped leaves, and roundish pods without glands. The generic name was given in honor of an Italian botanist, Mathioli, celebrated alike for his knowledge of plants and medicine. Its common name is derived from the circumstance of its requiring ten weeks from planting the seed to bloom. Its height is from one to two feet. It is a celebrated garden-flower, useful in some cases as a medicine, as it has, in common with all other plants of the natural order Cruciferæ, to which it belongs, the power of stimulating and of curing scurvy.

Florists direct that the plant should be raised on a hot-bed and transplanted to a rich sandy loam, in the middle or latter part of May; sand or chalk, enriched with vegetable mould, will do extremely well. It is the emblem, in floral language, of Precocity.

Camellia Japonica—Camellia—is in the class Monadelphia, order Polyandria. It is generically known by a many-leaved, imbricated or tiled calyx, the inner leaves of which are largest; the petals are of a broad egg-shape. It is specifically characterized by the shrubby stem, and egg-shaped, dark green shining leaves, which are awl-pointed and toothed on the margins. The calyx is of a light green color, and the corolla fleshy and of a bright red, contrasting beautifully with the orange-yellow stamens. It is upwards of twelve feet in height. It belongs to the natural order Ternstromiaceæ.

Camellias should be cultivated in pots, filled with sandy loam or peat, and then planted in the conservatory. The soil should be a sandy loam, mixed with about half the quantity of leaf-mould. They require considerable water when growing, but this should never be thrown upon them while the sun is shining, as it will cause the leaves to blotch. It may be propagated by cuttings taken off at the base of a leaf, or at a joint, as soon as the wood is ripened, and planted in sand, under a glass. It is the emblem, in floral language, of Lasting Beauty.

DICTIONARY OF FLOWERS,

WITH

THEIR EMBLEMATIC SIGNIFICATIONS

Acacia,	Friendship.
——— Rose.	Elegance.
Acanthus,	The Arts.
Achillea Millefolia.	War.
Adonis, flos,	Painful recollections.
Almond-tree,	Indiscretion.
Aloe,	Grief.
Amaranth,	Immortality.
Amaryllis,	Pride.
Anemone,	Forsaken.
———, field,	Sickness.
Angelica,	Inspiration.
Angrec,	Royalty.
Apple blossom,	Preference.
Ash tree,	Grandeur.
Asphodel,	My regrets follow you to the grave.
Aster, China,	Variety.
———	After-thought.

Balm of Gilead	Cure.
——— gentle,	Joking.
Balsam,	Impatience.
Barberry,	Sourness of temper.
Basil,	Hate.
Beech,	Prosperity.
Bilberry,	Treachery.
Bladder-nut,	Frivolous amusement.
Borage,	Bluntness.
Box-tree,	Stoicism.
Bramble,	Envy.
Broom,	Humility
———	Ardor.
Buck-bean	Calm repose.
Bugloss,	Falsehood.
Bulrush,	Indiscretion.
Burdock,	Touch me not.
Buttercup,	Ingratitude.

Cactus, Virginia,	Horror.
Canterbury bell,	Constancy.
Catchfly,	Snare.
Champignon,	Suspicion.
Cherry-tree,	Good education.
Chestnut-tree,	Do me justice.
Chicory,	Frugality.
Cinquefoil,	Beloved daughter
Circæa,	Spell.
Clematis,	Artifice.
Clot-bur,	Rudeness.
Clove-tree,	Dignity.
Columbine,	Folly.
Convolvulus, night,	Night.
Coriander,	Hidden merit.
Corn,	Riches.
Cornbottle,	Delicacy.
Cornel Cherry-tree,	Durability.
Cowslip, American,	You are my divinity.
Cress,	Resolution.
Crown Imperial,	Power.
Cuscuta,	Meanness.
Cypress,	Mourning.

Daffodil,	Self-love.
Daisy,	Innocence.
———, garden,	I share your sentiments.
———, wild,	I will think of it.
Dandelion,	The rustic oracle.
Day-lily, yellow,	Coquetry.
Dittany,	Childbirth.
Dock, patience,	Patience,
Dodder,	Meanness

Ebony-tree,	Blackness.
Eglantine,	Poetry

Fennel,	Strength.
Fig,	Longevity.
Fir-tree	Elevation.
Flax,	I feel your kindness.
Flower-de-Luce,	Flame.
Forget-Me-Not,	Forget me not.
Fraxinella,	Fire.
Fuller's Teasel,	Misanthropy.

Geranium, pencilled-leaf.	Ingenuity.
———, rose-scented,	Preference.
———, scarlet,	Stupidity.
———, sorrowful,	Melancholy mind.
———, wild	Steadfast piety.
Grass,	Utility.

Hawthorn,	Hope.
Hazel,	Peace, reconciliation.
Heart's-ease,	Think of me.
Heath,	Solitude.
Heliotrope, Peruvian,	Devoted attachment.
Hellenium,	Tears.
Hepatica,	Confidence.
Holly,	Foresight.
Hollyhock,	Ambition.
Honeysuckle,	Generous and devoted affection.
Hop,	Injustice.
Hornbeam,	Ornament.
Horse-chestnut,	Luxury
Hortensia,	You are cold
Hyacinth,	Game, play.

Ice-plant,	Your looks freeze me.
Ipomæa,	I attach myself to you.
Iris,	Message.
Ivy,	Friendship
Jasmine,	Amiableness.
———, Carolina,	Separation.
———, Indian,	I attach myself to you
Jonquil,	Desire.
Juniper,	Protection.
Larch,	Boldness.
Larkspur,	Lightness.
Laurel,	Glory.
Laurustinus.	I die if neglecled.
Lavender,	Mistrust.
Leaves, dead,	Sadness, melancholy.
Lilac,	First emotions of love.
——, White,	Youth
Lily,	Majesty.
Lily of the Valley,	Return of happiness.
Linden-tree,	Conjugal love.
Liverwort,	Confidence.
London Pride,	Frivolity.
Lotus,	Eloquence,
Lucern,	Life.
Madder,	Calumny
Maiden Hair,	Secrecy.
Mallow,	Beneficence
Manchineel-tree,	Falsehood.
Mandrake,	Rarity.
Maple,	Reserve.
Marigold,	Grief.
———, Prophetic,	Prediction.
———, and Cypress,	Despair,
Marvel of Peru,	Timidity.
Meadow Saffron,	My best days are past.
Mezereon,	Coquetry, desire to please.
Mignonette,	Your qualities surpass your charms.
Milkwort,	Hermitage.
Misletoe,	I surmount all difficulties.
Moonwort,	Forgetfulness.
Moss,	Maternal love.
Mulberry-tree, Black,	I shall not survive you.
—————, White,	Wisdom.
Musk-plant,	Weakness.
Myrobolan,	Privation.
Myrtle,	Love.
Narcissus,	Self-love.
Nettle,	Cruelty
Nightshade, Bitter-sweet,	Truth.
—————, Enchanter's,	Spell.
Nosegay,	Gallantry.
Oak,	Hospitality.
Olive,	Peace.
Ophry's, Spider,	Skill.
Orange-flower,	Chastity.
——— -tree,	Generosity.
Orchis, Bee,	Error.
Parsley,	Festivity.
Passion Flower,	Faith.
Peppermint,	Warmth of feeling.
Periwinkle,	Tender recollections.
Pine-apple,	You are perfect.
Pink,	Pure love.
——, Yellow,	Disdain.
Plane-tree,	Genius.
Plum-tree,	Keep your promises.
—————, Wild	Independence.
Poplar, Black,	Courage.
———, White,	Time.
Poppy,	Consolation.
———,	Sleep.
———, White,	My bane, my antidote.
Potato,	Beneficence.

Primrose,	Childhood.
————, large flowered, evening,	Inconstancy.
Privet,	Prohibition.
Quince,	Temptation.
Ranunculus,	You are radient with charms.
Reeds,	Music.
Rose,	Love.
——, Hundred-leaved,	Grace.
——, Monthly,	Beauty ever new.
——, Musk,	Capricious beauty.
——, Single,	Simplicity.
——, White,	Silence.
——, Withered,	Fleeting beauty.
Yellow,	Infidelity.
Rosebud,	A young girl.
————, White,	A heart unacquainted with love.
Rosemary,	Your presence revives me.
Rue, wild,	Morals.
Rush,	Docility.
Saffron,	Beware of excess.
Sage,	Esteem.
Sainfoin, Shaking,	Agitation.
St. John's wort,	Superstition.
Sardonia,	Irony.
Sensitive Plant,	Chasity.
Snapdragon,	Presumption.
Snowdrop,	Hope.
Sorrel, Wood,	Joy.
Speedwell,	Fidelity.
Spindle-tree,	Your charms are engravon on my heart.
Star of Bethlehem,	Purity.
Stock,	Lasting beauty.
——, Ten-week,	Promptness.
Stonecrop,	Tranquility.
Straw, broken,	Rupture of a contract.
———, whole,	Union.
Strawberry,	Perfection.
Sunflower,	False riches.
Sweet Sultan,	Happiness.
Sweet William,	Finesse.
Sycamore,	Curiosity.
Syringa,	Fraternal love.
Tansey, Wild,	I declare war against you
Tendrils of climbing plants,	Ties.
Thankfulness,	Acrimony.
Thistle,	Surliness.
Thorn-apple,	Deceitful charms.
Thrift,	Sympathy.
Thyme,	Activity.
Tremella Nostoc	Resistance.
Truffle,	Surprise.
Tuberose,	Dangerous pleasures.
Tulip,	Declaration of love.
Tussilage, sweet-scented,	Justice shall be done to you.
Valerian,	An accommodating disposition.
————, Greek,	Rupture
Venus's Looking-glass,	Flattery.
Veronica,	Fidelity.
Vervain,	Enchantment.
Vine,	Intoxication.
Violet,	Modesty.
———,	Innocence, candor.
Wallflower,	Fidelity in misfortune.
Walnut,	Stratagem.
Whortleberry,	Treachery.
Willow, Weeping,	Mourning.
Wormwood,	Absence.
Yew,	Sorrow.

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APPENDIX.